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VOLUME 126, No. 1 JANUARY 1, 1948

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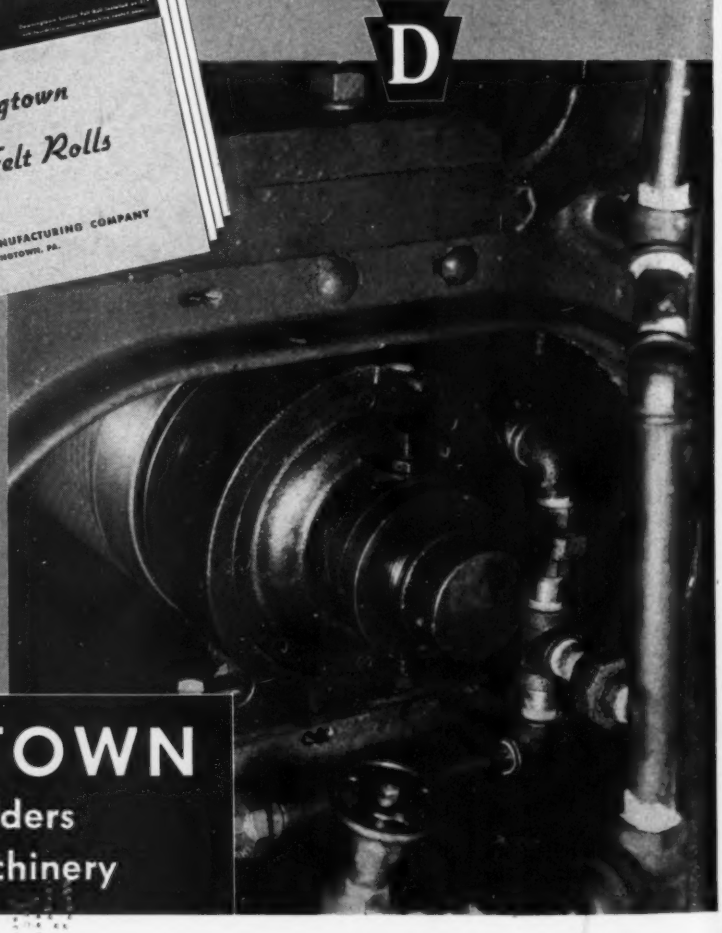

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Volume 126 — **Number 1**

Paper TRADE JOURNAL

REG. U. S. PAT. OFF.

Executive and Editorial Offices: 15 W. 47th St., New York 19, New York
Published Every Thursday by Lockwood Trade Journal Co., Inc.

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Bibliotekgatan 6-8, Stockholm, Sweden

Subscriptions: (Payable in advance) By the year, $5.00; Single Copy, 15 cents; *Postage Extra: To Canada,* $2.00; *To Other Foreign Countries,* $3.50. Member Audit Bureau of Circulation.

PAPER *established Feb. 17, 1899, combined with* PAPER TRADE JOURNAL, *Nov. 16, 1899.* PAPER *established Sept. 21, 1910, combined with* PAPER TRADE JOURNAL, *Feb. 19, 1926.* *All rights to the above titles reserved.*

PAPER TRADE JOURNAL *is entered as Second Class matter at the Post Office at East Stroudsburg, Pa., under Act of Congress of March 3, 1879. Publication Office at Lockwood Trade Journal Co., Inc., 34 N. Crystal St., East Stroudsburg, Pa. Printed in U. S. A.* *Copyright 1947 by the Lockwood Trade Journal Company, Inc. The contents of* PAPER TRADE JOURNAL, *including all articles, illustrations, etc., are covered by copyright and may not be reprinted except by permission.*

PAPER TRADE JOURNAL *is indexed in Industrial Arts Index.*

CALENDAR OF COMING EVENTS

January 28-30—Technical Section, Canadian Pulp and Paper Association, Annual Meeting, Mount Royal Hotel, Montreal, P. Q.

February 23-26, 1948—Technical Association of the Pulp and Paper Industry, Annual Meeting, Hotel Commodore, New York City.

May 18-20, 1948—American Pulp and Paper Mill Superintendents Association, Annual Meeting, Roosevelt Hotel, New Orleans, La.

June 11-12, 1948—Paper & Twine Association, Annual Convention, French Lick Springs, Indiana.

CENTENNIAL SPOTLIGHT
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In this 100th anniversary year as Machine Builders for the Paper Industry, Puseyjones points with pride to outstanding post-war installations. In the spotlight . . . 245" Fourdrinier Machine built for: The Champion Paper and Fibre Company, Canton, N. C.

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Paper TRADE JOURNAL

VOL. 126, NO. 1 REG. U.S. PAT. OFF. JANUARY 1, 1948

Trend Still Upward As Calder Sees It

NEW YORK—Per capita consumption of paper products will resume its upward trend during the coming year, based upon greater appreciation by the public during the war of the usefulness of paper packaging, and research developing new products, Alexander Calder, president of Union Bag & Paper Corporation, forecast this week. Pointing out that supply has not caught up with demand in the paper and paper board industry, despite strenuous efforts and plant expansions, Mr. Calder said that in the field of new products, particularly, "it seems doubtful that supply will equal demand even by the end of 1948."

During the past year Union Bag has added a corrugated shipping container division to its activities, completed a fifth paper machine at Savannah, which required two years in construction, and substantially expanded its bag factory.

"During 1948," Mr. Calder said, "we plan to continue with our program of installation of cost-reduction machinery and equipment on a large scale. At the same time, we are pressing hard to develop new products and new uses through research. We want to be fully prepared to contribute our share to the great flow of products, old and new, which will provide constantly increasing values for all purchasers of paper packaging.

"Critics of the American system of economic freedom like to insist that industrial leaders tend to hold back supply, and to exploit high demand to the hilt. These critics should take a good long look at the paper industry if they wish to see how wrong they are.

"Trade statistics and reports indicate that our highly competitive industry is exerting itself to the utmost to step up production, build new productive facilities, and improve products. Capacity has been increased about 25 percent since the end of the war. Further, the present short supply situation has not generally brought about price increases on a scale anywhere nearly as great as would have been encountered if each company were interested solely in immediate, high unit margin of profit.

Marcalus to Rebuild Its No. 1 Machine

LINCOLN, N. H. — The Marcalus Manufacturing Company, Inc., plans to shut down the No. 1 machine about January 15 for a complete rebuild job, which involves installation of all the latest devices to improve quality and increase speed nearly 100 percent.

The weight range will be broadened to enable this machine to make papers from lightweight manifold up to heavyweight indexes. This prospective development is part of a complete rehabilitation project which has been under way for two years and will require another year and a half for finishing the work.

Port Alberni Group Forms New Pulp Products Company

VANCOUVER, B. C. — Canadian Pulp Products Ltd. was recently incorporated under the British Columbia Companies' Act, with authorized capitalization of $100,000. Registered offices are c/o A. G. McCulloch, Croll Block, Port Alberni, B.C.

The organization is composed of Port Alberni men who plan the construction of a plant to manufacture various products from pulp wood.

BENTON R. CANCELL

whose elevation to be Chairman, Executive Committee, 1948, Canadian Pulp and Paper Association, Western Branch, was reported last week.

Ferguson Expects Continued Demand

NEW YORK—Present signs point to a continuation of a strong demand for the products of St. Regis Paper Company, according to Roy K. Ferguson, president.

In a year-end statement, Mr. Ferguson indicates that with sustained demand and taking cognizance of new capacity of the company which will come into production, it may be estimated that sales for 1948 will exceed 1947 by 15 percent.

Sales in 1947, he states, mounted to a new peak in the neighborhood of $140 million, compared with $82,782,186 in the preceding year, reflecting property acquisitions of 1946 and higher output.

The sharp rise in the company's volume of business, Mr. Ferguson points out, was coincident with the nearing completion of the current phase of the broad program of integration, modernization and expansion commenced by the present management in 1935. Currently, he adds, the company is devoting increasing attention to research and new product development, with technological progress pointed toward attainment of maximum efficiency, quality products and wider markets.

During the past year, states Mr. Ferguson, St. Regis substantially increased its timber holdings to insure adequate supply of basic raw material on a long-term basis. The company now owns or has cutting rights on close to 2,000,000 acres of forest lands.

Pointing out that it is being increasingly recognized in this country that the limiting factor on production of pulp and paper in the long run may be the supply of economically accessible wood, Mr. Ferguson adds: "St. Regis now has large resources of timber, advantageously located, and is following faithfully the most scientific forestry practices, with the goal in mind of sustained yield to provide for future needs."

Adding to its already large southern pulpwood holdings, the company during 1947 acquired the right to manage and utilize for a 60-year period 208,000 acres in Georgia's Suwannee Forest. The company also increased its timber holdings in Maine by 82,000 acres, through the acquisition of the Ellsworth Products Corporation of Ellsworth, Me. This purchase will help assure a perpetual supply of raw ma-

(Continued on page 14)

Bemis Places Proctor In Charge at Seattle

SEATTLE — Elwood M. Proctor has been appointed manager of the Bemis Bro. Bag Co. plant in Seattle. He replaces the late E. J. Gregg.

Mr. Proctor, an M.I.T. graduate in Mechanical Engineering, joined Bemis in 1926 at St. Louis as a member of the engineering department. In 1928 he went into sales promotion work, dealing mostly with consumer-size bags for potatoes and citrus. During this time he traveled extensively through Maine, Florida and California producing territories, returning to St. Louis in 1934 in the trade extension department.

He became manager of Bemis open-mesh sales in 1939. During World War II he also handled the distribution of burlap material within the company, and has since been in charge of burlap and open-mesh bag sales in the St. Louis general sales office.

Arnold Tells Staff Of Labor in Safety

MENASHA, Wis. — "Why Organized Labor Should Support the Safety Movement" was the topic of a talk by John Arnold, president of the Twin City Trades and Labor Council, before the Twin City Safety Council Wednesday evening, December 17. A 6:30 dinner preceded the program. Arnold is labor's representative on the safety council.

Clarence Elmgren, president of the safety council, announced that a complete study of community safety programs in the state is being made before the council expands its own activities to a community-wide rather than industrial basis.

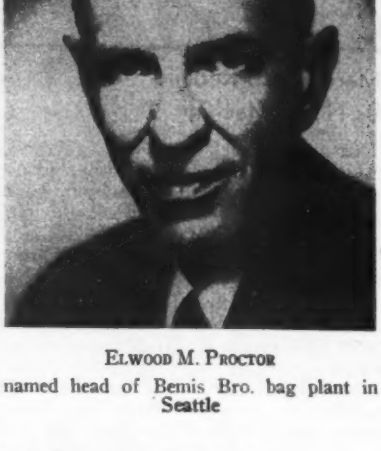
Boon Describes Expansion Program

KIMBERLY, Wis. — Kimberly-Clark Corporation's extensive expansion program was discussed by H. G. Boon, vice-president, at a meeting of the Foremen's club December 15. He said that the entire program is running on schedule. Motion pictures were shown of the K-C pulp mill at Terrace Bay in Canada.

Four new members were admitted into the club. Plans were discussed for an educational program in the coming year. Eighty were present at the dinner.

Fussell Joins Empire Box

HOOSICK FALLS, N. Y. — O. P. Fussell has been made assistant manager of the Empire Box Corporation at Stroudsburg, Pa., where he plans to make his home in the future. He has been prominently identified with paper mills in this section for several years.



ELWOOD M. PROCTOR
named head of Bemis Bro. bag plant in Seattle

Dicalite Names Bollaert General Manager

LOS ANGELES — Armand R. Bollaert has been appointed general manager of the Dicalite Division of Great Lakes Carbon Corporation and The Dicalite Company, effective December 10, 1947.

He is a graduate of the University of Chicago, thereafter joining the du Pont organization. Other positions have been technical director of J. W. Mortell Company, and manager of research for Celotex Company. For 5 years technical director of the Dicalite Division, he rejoins the organization after about a year's absence.

Mr. Bollaert will make his headquarters in Los Angeles, which is the company office nearest to the deposits and plants on the West Coast where Dicalite diatomaceous materials are produced.

Hammermill Families At Christmas Party

ERIE, PA.—Nearly 2,500 wives and children of Hammermill Paper Co. workers visited the plant December 23 for the firm's annual Christmas party.

The more than 2,000 tots, accompanied by their mothers, were taken on a brief tour of the big plants before being greeted by Santa Claus, who handed out the annual treat—a toy, plus a Christmas bag filled with nuts and goodies.

The annual treat for children has become an institution at the local paper plant, having been started some 30 years ago. Christmas carols were broadcast through the Hammermill area and there was a big open-air tree.

Personnel Director Charles B. Milner and his aides handled party arrangements.

Lacroix Again Heads Blankbook Local

HOLYOKE, Mass.—For the fourth consecutive year, Raymond Lacroix, a leather worker at the National Blank Book Company, for 25 years, was elected president of Local 48, International Brotherhood of Bookbinders, AFL, at recent plant elections. He polled 443 votes to 213 for his opponent, John Stimpson.

Michael Sheedy of Eureka Blank Book defeated William Kane for vice-president by four votes. Other officers elected are: Recording secretary, Miss Anna Ouellette; financial secretary, Miss Emma Connors; treasurer, Harry Wagner; sergeant-at-arms, Peter Bain; trustees, Alec Bain, Leo Gendron and John Lovie; executive board, William Boettcher, Walter Dietrich, Fred Kurschner, Edward Lavelle, Robert Soucy, Arthur Torno and John McSweeny of Eureka.

Federal Union Again Elects Theodore Tacy

HOLYOKE, Mass.—Theodore Tacy has been reelected president of the Federal Labor Union, Local 23,917, AFL, at B. F. Perkins & Sons, Inc., paper machinery manufacturers, at recent union elections. Reelected vice-president was Clyde Tulloch.

Other officers elected were: Walter Renner, recording and corresponding secretary, and John Laskowski, financial secretary-treasurer. Shop stewards elected were Andrew Basler, Joseph Yacovone, Louis Favreau, Lawrence Robitaille and August Goncalves.

Trustee for three years is Antonio Gauthier; for two years, Ernest Laporte, and for one year, Irene Benard. William Favreau was elected sergeant-at-arms.

Ryan Heads Local 226 Of Paper Mill Workers

HOLYOKE, Mass.—At a recent meeting of the Paper Mill Workers' Union, Local 226, Philip Ryan, veteran papermaker, was chosen president. He will succeed Fred Knowles. Other officers named were: Vice-president, Fred Musante; recording secretary, Joseph Richard; financial secretary, John Houlihan; treasurer, William Hunter; and trustees, Fred Knowles, Patrick Sweeney and William Mutch.

Sullivan Visits Port Edward

FORT EDWARD, N. Y. — Herbert W. Sullivan, who retired recently from his duties as an executive officer of the International Brotherhood of Pulp, Pulphite and Paper Mill Workers, was among recent visitors in this village. Mr. Sullivan, who has been with the organization for over forty years, was first vice-president at the time of retirement and an executive officer for almost thirty-eight years.

Union Bag Starts Second Corrugator

SAVANNAH—The second corrugating unit in the new box plant of Union Bag & Paper Corporation went on the production line December 20, stepping up the daily production of corrugated board from which boxes are made, to approximately 275 tons.

O. C. Fentress, superintendent of the box plant, said the new corrugator, manufactured by the S & S Corrugated Paper Machinery Company, is similar in design to the Langston Corrugator, which began operations two months ago, and represents the last word in corrugating equipment and design.

He added that the high-speed piece of equipment which is approximately 300 feet long, started up in "splendid fashion" and that he expected it to be producing board at its maximum capacity of 135 tons daily within the next several days.

"The box plant, representing Union Bag's newest converting operation, has been running on three shifts daily for the past month, and while all equipment has not yet been installed, the unit is already providing employment for an additional 150 Savannahians."

The *Savannah Morning News* pointed out that a check of orders completed and those on file revealed that the local box plant, although in operation only a little more than 60 days, is producing corrugated containers for approximately 20 concerns in all sections of the country selling nationally advertised articles and goods.

Neenah and Bergstrom Stage Joint Children's Party

NEENAH, Wis. — Children of employes of the Neenah Paper Company and Bergstrom Paper Company will attend a Christmas party the afternoon of December 22 at the Neenah theater. The event is sponsored jointly by the two companies. Admission will be by ticket only. The program includes a two-hour movie, climaxed by a visit from Santa Claus.

Conservation Group Will Oppose Menominee Dam

MADISON, Wis.—The Wisconsin Conservation Commission has objected to construction of a new dam on the Menominee river by the Wisconsin Michigan Power Company, on the ground that it would damage or destroy scenic beauty. The utility has applied for permission to build the new dam at Big Quinnessec falls, near Niagara, Wis. The Conservation commission will file its objections with the Wisconsin Public Service Commission, which has charge of granting permits for such projects. Its objection is primarily for the record.

Chairman Charles Smith, who did not vote on the Conservation commission's protest against the dam, advised the other members not to "go off half cocked," and persuaded them again to defer a decision on other dams until a more exact investigation of the wildlife considerations can be made.

The Conservation commission thus took no stand on other hydroelectric projects, such as the Wisconsin River Power Company's Petenwell project near Necedah.

Gefaell Foresees Three-Year Crisis

PALM BEACH, Fla.—John E. Gefaell, American paper manufacturer, who arrived at his winter home here December 16 after a trans-Atlantic business trip, expressed the opinion that the United States and Canada should work out of the present paper shortage in about three years, "but for Europe it looks like a struggle rivaling the Thirty Years War.

Mr. Gefaell, accompanied by Wilbur Cochrane, Canadian minister of lands and forests, and Earl Rowe, member of the Canadian Parliament, toured Belgium, France, Norway and Sweden, chief European sources of raw material for the manufacture of paper products.

"They are convinced the North American continent must look homeward if it is to meet the tremendous increase in the demand for wood pulp," Mr. Gefaell said in an interview here.

The paper manufacturer cited figures showing that while the last commercial paper mill was built on this continent in 1929, the reading public has increased its demands by 35 percent since that time.

"Though strikes and labor trouble have retarded construction of machinery and interfered with getting the raw products to the mills," Gefaell said, "we feel confident the two nations will solve the problem in three years, with Canada the source of raw materials and the United States the consumer. Canada still is rich in untouched timber lands," he added.

Jansen is Feted On Retirement

KIMBERLY, Wis. — John G. Jansen, Little Chute, retired from Kimberly-Clark Corporation's employment on January 1, after a service which began in 1900. In addition to his other duties, he served on the editorial staff of *Cooperation*, K-C publication, since it was first issued in 1917. The staff honored him Monday evening, December 29, at a banquet at the clubhouse. The only other member of the Kimberly staff of editors who served from the inception of the house organ is Joe Sandhofer.

Holyoke Aldermen Veto Power Plan

HOLYOKE, Mass.—The Board of Aldermen has sustained Mayor Henry J. Toepfert's veto on the planned Municipal Gas and Electric Department's power development which would take away power rights now owned by paper mills along Holyoke's extensive canal system. The vote was 13 to 8.

Prior to taking action on the veto, a move was made, spearheaded by Alderman John F. Sullivan, chairman of the power and light committee, to have it held up until an opinion could be received from the City Solicitor on the mayor's right to veto the aldermanic action.

The bill on which Mayor Toepfert exercised his veto had read:

"Ordered that the Board of Aldermen endorses the action of the Gas & Electric Commission and manager in filing an application for a preliminary permit with the Federal Power Commission for the development of a hydro-electric project which would utilize all the resources of the Connecticut river at Holyoke and recommends that the Gas & Electric Department make a thorough study of the possibilities of the development and the benefits thereof to the city of Holyoke and its vicinity."

Despite the action by the Alderman, however, an application for a preliminary permit to begin construction of an $8,800,000 proposed hydro-electric power development at the Holyoke dam already has been filed with the Federal Power Commission, on behalf of the city, by Francis H. King, Gas & Electric Department manager.

Officials of the FPC in Washington indicated, however, that no hearing date has as yet been set on the petition.

Atty. John S. Begley, counsel for the Holyoke Water Power Company, which provides the necessary power for the paper mills on the canals, charges that King filed his petition with the FPC on behalf of the city, despite the fact that he has no authority to do so. An opposite opinion is held by Atty. Hugh J. Lacey, counsel for the Gas & Electric Department.

Eaton Christmas Dance Welcomes Old Timers

PITTSFIELD, Mass. — Five hundred and fifty employes of the Eaton Paper Corporation attended the annual Christmas dinner-dance.

Ten employes were welcomed as members of the Quarter Century Club, bringing to 152 the total membership in the group. Those who received emblems and government bonds in honor of 25 years of service with Eaton were Alice M. Belair, Marion E. Canavan, Mary A. Cushing, Julia A. Ethier, Phena C. Froioland, Josephine Nigrelli, Harry M. Collins, Harold N. Currier, Charles B. Spence and Richard N. Depew.

Truck Loggers Meet In Mid-January

VANCOUVER, B. C. — Arrangements have now been completed for the fifth annual convention of the Truck Loggers Association of British Columbia, which will be held in the Hotel Vancouver, January 14, 15 and 16. Clair C. Smith is president of this organization with F. H. Parker as vice-president and Fred H. Adames as secretary.

The convention will open with registration at 9 a.m. Wednesday, January 14. The opening luncheon will be held at noon in the Banquet Hall, when the speaker will be E. T. F. Wohlenberg, Western Forest and Conservation Association, Portland, Oregon, who will take as his topic "Timber Resources."

At the afternoon session much consideration will be given to political and radical movements and their effect in the logging industry. Senator Gray Turgeon will speak on "Would Communism or Any Other Form of Socialism Benefit the Canadian Worker?" Dr. W. G. Black, University of British Columbia, will give as his subject "Are Ideologies Being Taught in Our Schools and Colleges?" Walter S. Owen, K.C., will speak on "Communism in Our Trade Unions," while Col. Walter DeLong, Public Relations Counsel, Weyerhaeuser Timber Co., Tacoma, Wash., will review the subject of "What Can Industry Do to Improve Employer - Employee Relationships?"

The address on the morning of the second day of the convention will deal with technical problems of the logging industry.

John Ulander, of the Victoria Lumber Company, will speak of "The Mechanics of Falling and Bucking," while Art Francis of the Workmens' Compensation Board, will discuss the accident rate in these two occupations. Pre-loading will be discussed by J. C. Sheasgreen of the Comox Logging & Railway Company.

"The Future of the Power Saw" will be the subject of an address by D. E. McGaw, Henry Disston & Sons Ltd., while G. W. J. Carter will speak on taxation as it affects the industry.

A luncheon and fashion show will be staged for the ladies of the convention at noon through the courtesy of the allied machinery trades.

Following the procedure of former years, there will be an open forum on the second afternoon of the convention, when the subject of management licenses will be discussed. The Hon. E. T. Kenney, Minister of Lands & Forests, will be the chairman for this session, and C. D. Orchard, Deputy Minister of Lands & Forests, John S. Mottishaw, Forester, Bloedel, Stewart & Welch Ltd., and W. L. Keate, Jr., Port Neville Logging Co. Ltd., will be the special speakers. An open discussion will follow.

At 6:15 p.m., delegates will be the guests of machinery men at a cocktail party and cold buffet supper in the Hotel Vancouver ballroom.

Sessions on the third day will be confined to membership only. In the morning the president and secretary's reports and various committees' reports will be presented, and election of officers will follow. The general business meeting of the session will be held in the afternoon, while a luncheon has been arranged for noon.

The convention will conclude with the annual banquet and dance in the ballroom of the Hotel Vancouver, Friday evening.

B. C. Sets Its Goal At 16 Million Trees

VANCOUVER, B. C.—During the coming year 16 million trees will be planted in British Columbia as part of the provincial government Forest Service reforestration program, according to the Hon. E. T. Kenney, Minister of Lands and Forests. Nine areas on Vancouver Island to be included in this reforestration program are Lawson Lake, Morton Lake and Salmon River Valley, all in vicinity of Campbell River; Horne Lake, Great Central Lake, Shawnigan Lake, Hillcrest, and Robertson River Valley, near Duncan.

Projects in preparation for the Spring planting program are almost completed, the minister said. They consist of snag - falling, opening up old logging grades for truck trails, and building of camps to accommodate the 400 men needed to plant trees on 20,000 acres.

Some logging companies will be reforesting their own areas, and it is anticipated they will plant several million of the total that will be ready to go out from three Island nurseries.

Annual planting project, which failed completely in 1945 because of impossibility of securing labor, works against two troublesome bottlenecks:

1. Planting cannot start in spring until snow and ground conditions permit, and must be discontinued before new growth starts in the young trees. This confines planting to about six and never more than eight weeks.

2. Job is of such short duration it has to depend almost exclusively on casual labor. Large numbers of men must be recruited and organized for the six to eight-week period, and depends on availability of manual labor.

Crowley Heads Cohoes Branch

COHOES, N. Y.—The local branch of the International Brotherhood of Papermakers has elected Merton W. Crowley as president to succeed Robert McLeon. Other officers elected for the next year include James Garfield, vice-president; Ethel Barnett, recording secretary; Veronica Lowes, financial secretary; Charles Bull, treasurer; Henry Bertrand, Thomas Bowes and John Swasey, trustees. Installation of officers is slated to be held next month.

Private Foresters Elect Swenning

MINNEAPOLIS—Karl Swenning, Hollingsworth & Whitney Company, was elected chairman of the Division of Private Forestry at the annual meeting of the Society of American Foresters, at Minneapolis, on Thursday, December 18.

Other officers are: Earl Porter, International Paper Company, Mobile, Ala., vice-chairman; Wayne Lewison, Draper Corporation, Plymouth, N. H., secretary; members of the executive committee, E. B. Hurst, Consolidated Water Power and Paper Company, Wisconsin Rapids; Stuart Moir, Western Pine Association.

E. B. Hurst, who acted as chairman of the division meeting which attracted 117 foresters from 29 states, said that the interest shown marked the event as a milestone in the progress of Private Forestry in this country. The objective of the division is to advance forestry on private lands.

Highlights of the division meeting centered about papers and discussion on controlled cutting under a cooperative management agreement; factors of cost of silviculture in relation to logging, legal licensing of foresters, forestry and labor unions, and cooperation with the small woodland owner.

At the general session of the Society held on Friday, December 19, the theme of the program was "Progress of Private Forestry in the Lake States." Bruce G. Buell of the Northern Paper Mills, Green Bay, George B. Amidon of the Minnesota and Ontario Paper Company, International Falls, Minnesota, and C. G. McLaren of the National Container Corporation, Tomahawk, Wisconsin, outlined the strides made and plans for the development of industrial forestry by the paper industry in the region.

The results of a survey made by George Amidon among 112 pulp and paper mills in the Lake States showed that this industry owns approximately 2 million acres of forest land, employs 130 foresters, and has replanted 60,000 acres.

C. G. McLaren stressed the tremendous investments by the Lake States pulp and paper industry and that the industry should produce one-half of its own raw material. He pointed out that Lake States mills imported from Canada 26.6 percent of the total wood they used in 1946.

Bruce Buell cited figures on how it requires millions of dollars to convert pulpwood into paper, while at the same time a portable sawmill representing an investment of $1000 can cut and market timber from raw logs.

Carter Rice Holds Christmas Party

BOSTON—A Christmas party for all employees of Carter Rice & Company Corporation was held at the Parker House, December 22.

Polytechnic Offers New Lecture Course

BROOKLYN, N. Y. — The Polytechnic Institute of Brooklyn will present a second group of 15 lectures in Pulp and Paper Technology beginning February 4. Formerly a one-year course, Pulp and Paper Technology was presented for the first time this year as two distinct one-semester courses.

The lectures, dealing specifically with paper and paper conversion, will be presented by Dr. Robert S. Aries, adjunct professor in the Department of Chemical Engineering, and representatives and consultants of the pulp and paper industries, on Wednesday nights from 6 to 8 p.m.

Although the industry is producing almost sixty percent more paper than it produced in 1940, according to Dr. Donald F. Othmer, head of the Chemical Engineering Department, the need for paper is still unsatisfied. Pulp and Paper Technology will stress instrumentation and automatic control of various pulp and paper operations which will enable plants to produce twice the pre-war production with one-third the manpower.

The course will also include the processes for the production of pulp and paper from wood and other fibers, various stages of operation of the pulp and paper mills, with reference to the chemical and engineering aspects of design and operation, and some of the newer processes of coating and combining of papers with plastics. Paper combined with plastics, Dr. Othmer said, produces such articles as trays, the dashboards of cars, and paper bags with a 35 percent increase in strength.

All types of pulp and paper products, from tissue and cigarette paper to roofing papers, wall board and insulating materials will be discussed. Fine cigarette papers, Dr. Othmer pointed out, were originally imported from France, but United States production has advanced so far that shipments are now made to France.

Offered on the graduate level, Pulp and Paper Technology is open to college graduates and those people in the paper mill industries, or connected with lithographers, printers or the New York technical offices of paper companies, who would like to become acquainted with new developments in the industry.

Vonachen Opens at Peoria To Serve Industries

PEORIA — The Vonachen Industrial Supplies Company has recently been established in business in central Illinois and will handle paper and paper products for the large concentration of industrial activity in that area and to also supply the commercial trade in central Illinois. J. R. Vonachen, for some time representing coarse paper interests in Illinois, is the operator of the new organization.

ROBERT SEIDL

Of the U. S. Forest Products Laboratories, who will address the Chicago Section of TAPPI on January 19.

Order of Oldsters Adds 25 Members

APPLETON, Wis.—Employes with 25 or more years of service were honored recently by two companies. On Friday evening, December 12, the Tuttle Press initiated 25 employes into the Ancient Order of Oldsters at a dinner and program at North Shore Country Club, and on the following evening 46 employes of the Appleton Wire Works were initiated into the same organization after a dinner at the Conway hotel.

Edward N. Smith, who has represented Tuttle Press on the Pacific Coast for more than 20 years, came from Los Angeles, and Joseph Martin, southern representative, was present from Memphis. Mr. Smith has been with the company for 37 years, and Mr. Martin for 27 years. The latter will retire at the end of the year and will be succeeded in his territory by his son.

R. H. Purdy, president of Tuttle Press, congratulated the employes on their long service records. They were given service pins and wrist watches.

A similar program was carried out for veterans of the Appleton Wire Works. They also were presented with service pins and wrist watches. The dinner and program also commemorated the 100th anniversary of the founding of the paper mill wire cloth industry in the United States.

John Brown, who began working for the company when he was about 15 years of age, was employed when it started operations here 51 years ago. Another half-century employe is Frank Rubbert, who started work November 3, 1897. Henry G. Meyer and Carl Lange went on the payroll in the following year.

Upson Sees Continued Building Board Call

LOCKPORT, N. Y. — Though it is not impossible that some degree of merchandising effort may have to be added to ability to ship goods as the trade passes from its buyers' market a busy year looms ahead of the building board industry. This is the seasoned view of the Upson Company. Its statement declares:

"In our company, as in our industry, the past year has been marked by a constant struggle to meet the demands of builders and homeowners for our building products.

"We feel that we have made headway by increasing the volume of shipments of our building boards while demand for new housing has been increasing and accumulating. With increased production capacity, we are entering the new year confident that we will more nearly be able to meet the requirements of the trade in 1948 than in the year closing.

"Based on present conditions, the volume of home building should be larger in 1948 than in 1947. Economists persist in emphasizing the country's need for at least a million housing units each year for the next ten years. Among factors that might change conditions as we know them today are: moisture conditions as they affect 1948 crops, uncertainties of a presidential year, by the legislation and policies created at Washington, how well inflation and rising prices are controlled, and our foreign relations.

"While supplies of key materials and construction man-power are not yet sufficient to meet current building requirements, it is likely that most construction materials will be fairly plentiful in 1948 and may even have to be priced to meet competitive selling.

"Barring unexpected developments, our industry, in general, and our company, in particular, are looking forward to another busy year in 1948."

Wisconsin Plantings Reach 25 Million

MADISON, Wis.—Machines are speeding reforestation in Wisconsin. They have set out 25 million trees since the first mechanical planting device was demonstrated four years ago, according to Fred Trenk, University of Wisconsin extension forester, who spoke recently at the national convention of the Society of American Foresters in Minneapolis.

These mechanical plantings included those by paper mills, farmers and public foresters, he declared. An additional five million trees were machine-planted in Michigan and Minnesota, he said.

FINANCE

Coosa River Registers 238,829 Common Shares

PHILADELPHIA—Coosa River Newsprint Company, organized in Alabama on March 18, 1946, to erect and operate a mill for the manufacture of newsprint, last week filed with the Securities and Exchange Commission a registration statement covering 238,829 shares of $50 par value common stock. The shares are to be offered direct to the public at par through directors and officers of the company, who are to receive no commissions or other remuneration. The net proceeds, before expenses estimated at $38,394, will total $11,941,450.

Founded through the efforts of members of the Southern Newspaper Publishers Association and a group of citizens of Alabama, the company plans to construct a mill with a daily capacity of approximately 300 tons of newsprint, 250 tons of groundwood pulp and 200 tons of sulphate pulp.

The prospectus said that, in addition to the sale of common stock, the company also contemplated selling $16 million of 4 percent first mortgage bonds, bringing it an aggregate of $32 million with which to carry out its enterprise. The latter sum includes funds received from common stock already sold.

The founders and sponsors of the enterprise include the Kimberly-Clark Corporation, Atlanta Journal Company, General Newspapers, Inc., Birmingham News Company, Chattanooga News-Free Press Company, Advertiser Company, Inc., Times-Picayune Publishing Company, Constitution Publishing Company, Richmond Newspaper, Inc., Oklahoma Publishing Company, Tennessean Newspaper, Inc., Miami Herald Publishing Company, Courier Journal and Louisville Times Company, Nashville Banner Publishing Company, and News and Observer Publishing Company, Inc.

Mahler Tells Supervisors Of Present Conditions

NEENAH, Wis.—"Present Conditions and How They Pertain to the Paper Industry" were described Thursday evening, December 18, by Ernst Mahler, executive vice-president of Kimberly-Clark Corporation, in a talk at a 6:30 dinner meeting of the Lakeview Supervisors' club. Clarence Moder, chairman of the club's educational program, reported on the completion of the fall courses and plans for the spring courses beginning after January 1. Leon Villard sang Christmas carols, accompanied by Mrs. Villard.

Eaton Distributes Christmas Bonus

PITTSFIELD, Mass.—Distribution of the seventh consecutive wage dividend has been made to 714 employees of Eaton Paper Corporation, and its new subsidiary, Nascon Products, Inc. The schedule of payments for the wage dividend was based on length of service. Employees having 15 years' service or more were awarded two weeks' wages, while those with a shorter service record received dividends on a graduated scale.

Southern Pulpwood Group To Meet January 28

ATLANTA — The annual meeting of the Southern Pulpwood Conservation Association has been set for January 28, at the Ansley hotel. The Association serves the pulp and paper industry and timber growers from Texas to Virginia in a program to grow more timber through more effective and expanded forest fire protection and through the wise cutting of trees for all kinds of forest products.

The morning meeting of the Association, open to the public, will hear a progress report of the conservation activities of the Association and its members, a discussion of the pulpwood supply in the South, and cutting for continuous yield of all forest products. Since the annual meeting of last year, the members and the Association have employed approximately twenty-five men who devote full time to encouraging improved forest practices on the part of the timber grower. These activities are in addition to those of the large number of foresters employed by the pulp and paper mills in managing the several million acres owned by them.

The afternoon session will be for members only and will be devoted to a full discussion of the conservation program as now being conducted, for the purpose of improving and enlarging it. The meeting will be concluded with a banquet for members and invited guests.

Smith Paper Stages a Party

LEE, Mass.—About 100 members of the office staffs of Smith Paper, Inc., assembled recently at Oklawn Inn for a Christmas party tendered by the company.

FINANCIAL RECORD OF THE WEEK

New York Stock Exchange

High, Low and Last for Week Ending December 27, 1947

STOCKS

	High	Low	Last
A. P. W.	5½	5	5
Armstrong Cork Co.	50	48¾	49
Armstrong Cork Co., pf.	93¼	91¾	92
Celotex Corp.	27¼	26½	26¾
Celotex Corp., pf.	20	20	20
Certain-Teed Products Corp.	17½	16¾	16⅞
Certain-Teed Products Corp., pf.	....	....	....
Champion Paper & Fibre Co.	22	21	22
Champion Paper & Fibre Co., pf.	101½	100⅝	101½
Congoleum Nairn Co.	31¼	30¾	31
Container Corp. of America	42⅜	41½	41½
Container Corp. of America, pf.	96	96	96
Crown Zellerbach Co.	34¼	33½	33½
Crown Zellerbach Co., pf. 4.20	100¼	100¼	100¼
Crown Zellerbach Co., 4 pf. 4	129¼	124½	125½
Dixie Cup Co.	39	38⅛	38⅛
Dixie Cup Co., A	53	53	53
Flintkote Co.	38¼	36½	36⅝
Flintkote Co., pf.	102	102	102
Robert Gair	9⅛	8¼	8⅞
Robert Gair, pf.	19½	19½	19½
International Paper Co.	56⅜	54	54⅜
International Paper Co., pf.	98	94¼	94¾
Johns-Manville Corp.	41⅝	40	40
Johns-Manville Corp., pf.	111¾	110¼	110¼
Kimberly-Clark Corp.	22⅞	22⅛	22⅜
Kimberly-Clark Corp., pf.	103¾	103	103
Mac Andrews & Forbes	40½	39½	39½
Mac Andrews & Forbes, pf.	....	....	....
Marathon Corp.	21½	20½	20¾
Mead Corp.	20	19¾	20
Mead Corp., pf. 4¼	93	93	93
Mead Corp., pf. 2	43	42½	42½
National Container Corp.	13½	13⅛	13⅛
Paraffine Companies, Inc.	71¾	71½	71½
Paraffine Companies, Inc., pf.	100	99½	99½
Rayonier, Inc.	32	30½	31⅛
Rayonier, Inc., pf.	33⅞	32⅞	32⅞
Ruberoid Co.	67	65	65
St. Regis Paper Co.	10	9⅜	9¾
St. Regis Paper Co., pf.	82½	80	80
Scott Paper Co.	44	42¾	43¼
Scott Paper Co., pf.	93	92	93
Sutherland Paper Co.	42½	42	42¼
Union Bag & Paper Corp.	35¼	32¾	34⅛
United Paperboard Co.	15	15	15
U. S. Gypsum Co.	105	104½	104¾
U. S. Gypsum Co., pf.	....	....	....
United Wallpaper	5⅞	5½	5½
United Wallpaper, pf.	....	....	....
West Virginia Pulp & Paper Co.	43½	41¾	43½
West Virginia Pulp & Paper Co., pf.	107	105	105

BONDS

Celotex Corp., 3¼s '60	101	101	101
Certain-Teed Products Corp., 5½s '53	....	....	....
Champion Paper & Fibre Co., 3s '65	98½	98	98½
Mead Corp., 3s '68	....	....	....

New York Curb Exchange

High, Low and Last for Week Ending December 27, 1947

STOCKS

	High	Low	Last
Great Northern Paper Co.	45¼	45¼	45¼
Taggart Corp.	10½	10½	10½

BONDS

American Writing Paper Co., 6s '61	....	....	....

Dupont to Step Up Sodium CMC Output

WILMINGTON, Del. — The du Pont Company is expanding facilities at its Carney's Point, N. J., works for the production of sodium carboxymethyl cellulose, or Sodium CMC, a versatile chemical compound that is finding a variety of uses in important industries.

While the product is now being manufactured in substantial quantities the new facilities to be completed early in 1948 will be required to meet the anticipated demand. Greater emphasis will be placed on the production of technical grades of Sodium CMC to provide a low-priced material suitable for some of the major industrial applications.

Du Pont Sodium CMC is the sodium salt of carboxymethyl cellulose, often referred to as cellulose gum, sodium cellulose glycolate, and the sodium salt of a cellulose ether-acid. It is a water soluble cellulose ether of unusually versatile properties, produced in several grades and types. It can serve as an emulsifier, protective colloid, thickener, sizing agent or protective film. It is insoluble in organic solvents, greases and fats; at the same time, its films may be treated to yield a considerable degree of water resistance.

In paper making, since Sodium CMC films exhibit a marked degree of oil and grease resistance, Sodium CMC may be beater applied or surface applied to improve the grease resistance and printing surface of paper and paperboard. It has also been reported that the addition of Sodium CMC at the beater aids in the deflocculation of fibers and produces a paper having better erasibility, surface strength, and filler retention.

It also may be used effectively as a thickener or viscosity modifier for aqueous adhesive formulations. Since Sodium CMC exhibits certain adhesive properties it may at the same time improve the adhesive characteristics of the final formulation. These properties suggest its use in leather pasting adhesives; as a binder for crayons; as a sticking agent for insecticides; etc.

Monsanto Names Zerbe Development Director

NITRO, W. Va. — Appointment of Richard O. Zerbe as director of the newly created development department at the Monsanto Chemical Company plant here was made known last week by R. L. Sibley, general manager, rubber service department.

Zerbe, a native of Niles, Mich., was employed at the Monsanto Nitro plant in 1936 as an assistant research chemist. He was transferred to the plant's patent department a year later and in 1940 was appointed patent attorney.

A graduate of the University of Michigan, where he received an M.S. degree in 1936, Zerbe is registered to practice patent law before the United States Patent Office. He has served three years as a councilman of the city of Nitro and is the chairman-elect of the Charleston Section of the American Chemical Society.

White & Wyckoff Holds Postwar Sales Conference

HOLYOKE, Mass.—The first salesmen's conference of the White & Wyckoff Manufacturing Company, since pre-war days, was held here recently.

Speakers at the session included: George F. Abelein, manager of the stationery department; Albert H. Sampson, assistant treasurer and director of sales promotion; J. E. Hollwedel, New York office manager; T. K. Nickerson, Chicago office manager; George W. Mosher, traffic manager; Harry C. Dutton, president, and Edward P. White, treasurer. The keynote of the conference is: "Where Do We Go From Here." The sales session was directed by Mark L. Finch, manager of the greeting card department.

Salesmen from all over the country attended. They include: J. E. Hollwedel; Edward G. Batchler of New York, representative for the metropolitan and suburban trade; Jack Hollwedel, Jr., of New York, New Jersey representative; Robert O. Becker of Peoria, Ill., covering Illinois and Iowa; Samuel V. Buchanan of Chicago, Ohio state representative; Ralph B. Doane of Philadelphia; Albert H. Guenther of Holyoke, covering Western New England; Henry R. Weiland of Waban, covering eastern New England; Leonard J. Hanna of Jacksonville, Fla., representative in Georgia and Florida; Robert L. Heitbring of Park Ridge, Ill., Chicago city salesman.

Edward V. Jungbluth of Dallas, Tex., southwestern representative; J. Wood Mussina of East Orange, N. J., covering the mid-Atlantic states; K. W. Nelsen of St. Paul, Minn., northwestern representative; T. K. Nickerson of Chicago, midwestern manager; George W. Petzold of St. Louis, Mo., who covers some southern and western states; C. E. Robinson of Mill Valley, Calif., Pacific coast representative; E. James Smith of Danville, Ill., representative for Michigan and Indiana; Edgar A. Williams of Webster, N. Y., New York city representative, and George A. Witte of Wisconsin Rapids, Wis., covering midwestern states.

S. Ivers Joins Paramount As New England Manager

PHILADELPHIA — Paramount Paper Products Company of 501 N. 19th Street, manufacturers of specialty paper bags has appointed Lewis Silvers as New England territorial manager. This territory comprises the states of Massachusetts, Connecticut, Rhode Island, New Hampshire and Maine. Mr. Silvers will headquarter in Boston.

Hercules Found 1947 Hit New High Mark

WILMINGTON, Del.—Hercules Powder Company, one of the foremost producers of chemicals for the paper industry, made further contributions to the industry during 1947 as a result of its creative activities. Hercules sales to the paper industry reached a new high in 1947, a year in which the paper industry as a whole also made new records in production.

Ever since 1920, when Hercules entered the naval stores industry as a producer of rosin, the company has been associated with the paper industry. It has been one of the major producers of rosin for the paper industry for more than a quarter of a century. The company's association with the paper industry through the sale of rosin, led, in 1931, to the purchase of Paper Makers Chemical Corporation, which later became the Paper Makers Chemical Department.

At the company's experiment station near Wilmington, a large research staff devotes its efforts to improving existing Hercules products for paper making, and to the development of new products. The Paper Makers Chemical Department laboratory at its Kalamazoo, Mich., plant, is geared to create, develop, and test chemicals for the paper industry. Recently, this laboratory has added an experimental paper coating machine to its equipment. The machine is being used for development work on all phases of paper coating and paper treatment, to promote better printing and lithography.

Rosin size is produced at plants in Brunswick and Savannah, Ga.; Holyoke, Mass.; Kalamazoo, Mich.; Hattiesburg, Miss.; Portland, Ore.; and Milwaukee, Wis.

The research chemists of the Paper Makers Chemical Department, working with a new cellulose chemical, developed a paper coating which increases strength of paperboard, and makes paper more resistant to oils and waxes. The greater resistance to penetration, they found, resulted in higher quality gloss printing and a saving in ink and wax. The same chemical also adds internal strength to paper.

Another product, Parlon, or chlorinated rubber, returned to full-scale production in 1947, after being discontinued during World War II, when natural rubber was not available. Parlon, a thermoplastic, is used in paper coatings for food packages. Coatings made with Parlon resist the transmission of vapors.

The completion during the year of a new synthetic resin plant increases the company's output of paper finishing chemicals. The plant is located at Burlington, New Jersey. Among its products are Abalyn and Hercolyn resins which are used in transparentizing paper. Parlon, Abalyn and Hercolyn are registered at the United States Patent Office.

Ferguson Expects Continued Demand

(Continued from page 7)

terial for the company's important printing and publication paper mill at Bucksport, Me.

Mr. Ferguson reports that several important phases of the expansion program as scheduled for completion in 1948.

Early in the year the world's largest center of integrated multiwall paper bag production will be in full operation at Pensacola, Florida.

"Through our affiliation with James H. Allen and his associates, resulting in ownership of Florida Pulp and Paper Company and Alabama Pulp and Paper Company," according to Mr. Ferguson, "the original Florida mill with a present capacity of 200 tons of kraft paper daily will be added to in the first quarter of 1948 by the Alabama mill with a rated daily capacity of 250 tons."

Adjacent to these properties, the new St. Regis multiwall bag plant, designed to consume 200 tons of kraft paper daily and capable of turning out over 150,000,000 multiwall paper bags annually, will go into operation in the near future.

At Tacoma, Wash., site of the company's sulphate pulp mill, St. Regis has commenced construction of a kraft paper mill with a daily capacity of 240 tons. This mill, Mr. Ferguson indicates, should be in production by the end of 1948. As a further step, the company plans to build a multiwall bag plant there to round out an integrated operation with the sulphate pulp and kraft paper mills.

The company, he adds, looks forward with confidence to a steadily widening utilization of the multiwall paper bag as a shipping container for industry and has planned these important additions to productive capacity in order that it may participate fully in the widening market.

Further progress is reported by Mr. Ferguson in the company's Printing and Publication Paper division, notably in the direction of broadening grades and in extension and improvement in coating operations. During the past year the Deferiet, N. Y., mill placed a second on-the-machine coater in operation and a third will come into operation some time during the first quarter of 1948. At the Bucksport, Me., mill a machine coater is being designed which will be in operation late in the year. During the past year the new bleaching plant at Bucksport, for bleaching groundwood and sulphite pulp together, came into operation, while at the Deferiet mill, according to Mr. Ferguson, the company is planning further improvement in its pulp bleaching facilities.

The Panelyte Division of St. Regis, whose laminated plastic products are largely manufactured with a kraft paper base, achieved a new high level of output and dollar sales in 1947, and present indications point to further gains in 1948, according to Mr. Ferguson. During the past year, he adds, the Division developed a line of decorative plastics which opened up an expanded series of markets for Panelyte in the building and architectural field. Heretofore industrial usage has provided the major market for Panelyte.

Cleveland Container Local Holds Close Election

OGDENSBURG, N. Y. — In one of the closest contests in local union history Edward Sargent defeated Harold Tregeser, incumbent, by one vote for the presidency of the Cleveland Container local of the International Brotherhood of Pulp, Sulphite and Papermill Workers (AFL).

Charles Curbeau was elected to replace Dudley Bassett as vice-president of the union, and Fay Beane was chosen to succeed Ruth Tregeser as recording secretary. Walter Marlowe was reelected financial secretary, and Richard Fortin was re-elected treasurer.

Walter LaRue was also chosen to retain his post as inside guard, and three trustees, Charles Curbeau, James Halliday and Evelyn LaFlair, were reelected. Leonard Daniels will succeed Edward Sargent as chairman of the male shop stewards while Ruth Tregeser will take Evelyn LaFlair's position as chairman of the female shop stewards.

Supervising the election and installation of officers was Floyd C. VanDusen, international representative of the papermakers brotherhood. The union members also voted to defer the wage raises until their next meeting.

Two Hundred Attend Hurlbut Party

LEE, Mass. — More than 200 employes and guests attended the recent annual Christmas party of the Hurlbut Paper Company, in East Lee. At the party, the highlight was the distribution of bonus checks by the company to all employes.

Those who had worked for Hurlbut five years or more received three weeks' wages; two weeks' pay went to those whose service ranged from three to five years; and a week's wages was given to those who worked for the company from one to three years.

Edward A. Sitzer, president of the company, spoke briefly and distributed the bonus checks to the employes.

White & Wyckoff Distributes Bonus

HOLYOKE, Mass.—White & Wyckoff Manufacturing Company has distributed a bonus of one week's pay to all of its employes who have been with the company for a year or more. To those of less than a year's service, proportionate amounts were given. There are 400 working at the plant.

OBITUARY

Edward S. Sabourin

HUDSON FALLS, N. Y. — Edward E. Sabourin, founder and president of the Hudson Falls Paper Company, died recently at his home here after an illness of several years. Prior to founding the local concern he was associated with the Shuttleworth-Keiler Paper Company, of New York City. Besides being a director of the First National Bank of this village, he was also a member of the board of governors of the Glens Falls Country Club and a member of the Glens Falls Lodge of Elks. The principal survivors are his wife, a daughter, three sisters and two brothers.

Lewis F. Beers

HARTFORD, Conn. — Lewis Franklin Beers, 75, owner of the Sherwood-Beers Paper Box Co., of New York City for many years, died recently at the home of his son, Lewis Beers, Jr., in Windsor.

Mr. Beers was born in Darien, September 5, 1872, a son of the late Lewis F., and Adelia Hoyt Beers. He was associated with the Pope Manufacturing Co. of Hartford and later was the owner of the Sherwood-Beers Co., in New York. Mr. Beers retired in 1918.

In addition to his son, he leaves his wife, Mrs. Cornelia Jane (Banks) Beers, and two granddaughters.

Cornelius P. Carey

ALBANY, N. Y.—Cornelius P. Carey, 82, retired manager of Mohawk Paper Company plants at Cohoes and Waterford, died recently at Albany Hospital. His home was at 1475 Rugby Rd., Schenectady. A native of London, England, Mr. Carey came to this country when he was an infant. His family settled at Palmer.

He began his trade as a papermaker with International Paper Company in the Corinth, N. Y., and Berlin, N. H., plants. He later joined the St. Regis Paper Company as superintendent of the Herrings plant. Mr. Carey managed the Cohoes and Waterford plants of Mohawk Paper Company for many years prior to his retirement 17 years ago.

He is survived by his wife, the former Annie Donohoe; six daughters, Mrs. Mary E. Coan, Mrs. Walter A. Tone, Mrs. Thomas F. Garahan, Mrs. Patricia Schroeder and Miss Ann V. Carey, all of Schenectady, and Mrs. Paul D. Elliott, Albany; two brothers, Jeremiah T. Carey, Saratoga Springs, and Dennis B. Carey, New York City, and two grandchildren.

Western Sapeyes Hold Christmas Function

CHICAGO—About one hundred members and guests of the western division of the Salesmens Association of the Paper Industry gathered in the West Room of the Hotel Sherman on Monday afternoon, December 22, for one of the most enjoyable Christmas parties held in a long time. With the energetic Ben Babbitt of the Brown Company as the hospitality and program chairman, the participants enjoyed a cocktail, enjoyed one of the best buffet dinners the Sherman has presented in a long time and settled back for an hour and a half of entertainment marred in no instance by any speaking program, any introductions, any "business."

Mr. Babbitt introduced Vincent Gottschalk, mental gymnasist and mind reader with an international reputation, who thrilled the crowd with a startling exhibition of mathematical and mindreading powers topped off by his famous "cross word puzzle with figures" trick. Proving that it goes for barber shop harmony in a big way, as indicated by entertainment provided at the NPTA meetings in October, the SAPEYES again presented a barber shop quartette in the person of the "Midcity Four" and the sales executives and their guests thoroughly enjoyed the show—every note of it.

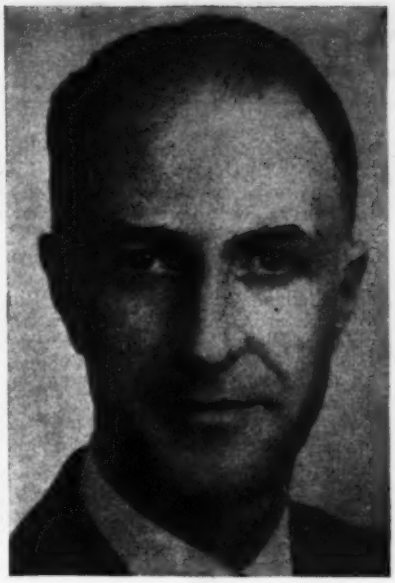
The next regular session of the SAPEYES will be on Monday, January 5, when Vice-president Ed Edwards promises the beginning of an important 1948 program and discussion of plans for attendance at the Paper Week meetings in New York City late in February.

Continental A. A. Runs Bowling League

RIDGEFIELD PARK, N. J. — Several hundred employees of the Continental Paper Company are now participating in organized athletics and social programs sponsored and directed by the Continental Athletic Association which was formed earlier this year.

Incorporated under the laws of New Jersey, the Association is governed by a council of eight members, four from the union and four from management. According to the by-laws, the purpose of this non-profit organization is "To establish, maintain and conduct various athletic activities and to conduct any social functions or perform any charitable acts which will tend to improve the Association."

Under the Association's direction, two bowling leagues have been formed, one for men and the other for female employees. The men's league has six teams, and the women's four. A basketball team also has been organized to represent Continental in a local industrial league. In the Spring, the Association again will sponsor a softball team.



FRANK J. BUSHEMI
Stages Philadelphia's Annual Christmas Party.

Midwest Ends Year On Confident Note

CHICAGO — Illinois is ending 1947 with retail trade at top figures, no sign of any real let down nor material price resistance and, from the standpoint of the paper trade, new possibilities that production will increase sufficiently in the next twelve months to make 1948 a "good" year. Higher prices, beginning with wood pulp and allied materials, are being forecast to have a definite effect in strengthening the over-all price position in all lines and there are indications in the Chicago paper market of an expectancy that prices will go up further before there is any possibility that they can come down. Freight rate increases and possible wage increases, along with fading hopes for substantial tax decreases, were listed as contributing factors in local offices.

From the waste paper markets came news that the lower grades were steady with demand not too spirited, though better grades of waste paper were said to be more active. No. 1 mixed papers in Chicago, per ton f.o.b. shipping point, were reportedly $15 while old corrugated was ranging between $26 and $27.

Blake, Moffitt, Towne Builds New Storage Warehouse

OAKLAND, Cal. — Work has been started on a new 100,000 square-foot warehouse and divisional office building for Blake, Moffitt & Towne in this city. The new plant, some four times the size of the company's present establishment here, is to be of reinforced concrete construction and three stories high. It will be served by a direct railroad spur.

Paper & Cordage Men Stage Annual Party

PHILADELPHIA—Santa Claus renewed his visits to the annual Christmas party luncheon of the Philadelphia Paper & Cordage Association for underprivileged children selected by the Salvation Army, held this year at the Benjamin Franklin Hotel on Wednesday, December 17. This affair, always a highlight in the year's activities, attracted a record attendance of 285. Included, were 60 young guests who received special attention throughout.

A delicious turkey dinner was served the youngsters by three carving experts, John R. Howarth, J. R. Howarth Paper Company; E. Kent Lay, E. K. Lay Company; and Howard Satterthwaite, Garrett-Buchanan Company. A gala show was staged, augmented by many contributions of several talented young lads and lassies. Santa Claus was master of ceremonies.

After the show, Santa distributed the gifts to the children, specially selected according to each child's needs and wishes. Brigadier Hazel G. Hood of the Salvation Army was in charge of the children, Lt. Colonel and Mrs. Edgar Arkett also of the Salvation Army were present. Col. Arkett expressed his grateful thanks to the officers, members and Ladies Auxiliary of P. P. & C. A. on behalf of the Salvation Army, the children and their parents.

Reverend Croswell McBee, honorary chaplain of Philadelphia Paper and Cordage Association, pronounced the invocation; Randall H. Decker, Jr., A. Hartung Company, president of the Association, welcomed members and guests.

Frank J. Bushemi, Garrett-Buchanan Company, was general chairman. Most of the detail work was capably handled by the Ladies Auxiliary of Philadelphia Paper and Cordage Association under the direction of Mrs. W. Brelsford Killhour, president.

Storrs & Bement Celebrates Its Hundredth Anniversary

BOSTON — The Christmas party of Storrs & Bement Company for 1947, the one hundredth anniversary of the establishment of the concern, held at the office of the firm December 24 was all that could be desired in the way of a good time. There was music and carol singing, with approximately 80 joining in the festivities, which included a catered dinner, a Christmas tree and dancing.

President William N. Stetson, Jr., said he was glad to have all the Storrs & Bement family around him again and referred to the anniversary. Two men who had been in the employ of the company fifty years, Arthur W. Gardner and Charles A. Baxter, were honored and saluted.

IMPORTS

NEW YORK IMPORTS

WEEK ENDING DECEMBER 27, 1947
SUMMARY

Newsprint	11,712 rolls
Drawing Paper	5 cs.
Photo Paper	10 cs.
Filter Paper	26 cs.
Coated Paper	75 cs.
Miscellaneous Paper	4 rolls

NEWSPRINT

News Syndicate Co., Empire Gangway, Baie Comeau, 1855 rolls.
N. Y. Sun, Stuart Prince, Cornerbrook, 1081 rolls.
N. Y. World Telegram, Stuart Prince, Cornerbrook, 944 rolls.
Clinton Paper Corp., Stuart Prince, Cornerbrook, 802 rolls.
S. B. Behrens, Arnedyk, Antwerp, 113 rolls.
(———), Arnedyk, Antwerp, 284 rolls.
News Syndicate Co., Colabee, Baie Comeau, 6633 rolls.

DRAWING PAPER

Green Kriegsman Paper Co., Inc., America, Southampton, 5 cs.

PHOTO PAPER

J. J. Gavin Co., Fort Ticonderoga, London, 6 cs. (unsensitized).
(———), Fort Ticonderoga, London, 4 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., Fort Ticonderoga, London, 26 cs.

COATED PAPER

F. P. Gaskell Co., Eucadia, Glasgow, 75 cs. (for cigarette tips).

MISCELLANEOUS PAPER

(———), Fort Ticonderoga, London, 4 rolls.

RAGS, BAGGINGS, ETC.

E. J. Keller Co., Inc., Flying Cloud, Istanbul, 1814 bls. cotton rags.
Bank of The Manhattan Co., Flying Cloud, Istanbul, 70 bls. new blue cotton cuttings.
(———), Flying Cloud, Bombay, 275 bls. old jute rags.
New England Waste Co., Troubadour, Buenos Aires, 442 bls. cotton waste.
New England Waste Co., Anniston City, Recife, 426 bls. cotton linters.
M. O. Schinel Corp., Anniston City, Recife, 354 bls. cotton waste.
Cowa & Co., Anniston City, Recife, 46 bls. cotton linters.
Royal Manufacturing Co., Creighton Victory, Antwerp, 130 bls. cotton waste.
Chase National Bank, Augustana Victory, Antwerp, 97 bls. jute bagging.
Williamson & Northrup, Bowhill, Santos, 427 bls. cotton linters.
New England Waste Co., Bowhill, Santos, 359 bls. cotton waste, 151 bls. cotton waste pickers.
Concentra Shipping Co., Exceller, Genoa, 36 bls. dark cotton rags.
Cecil Kutz, Yvonne, Rio de Janeiro, 230 bls. cotton waste pickers.
New England Waste Co., Yvonne, Rio de Janeiro, 193 bls. cotton waste pickers.
New England Waste Co., Yvonne, Santos, 200 bls. cotton waste pickers.

OLD ROPE

International Purchasing Co., Paraguay, Copenhagen, 162 coils.

GLUESTOCK, ETC.

Irving Trust Co., Bowhill, Buenos Aires, 99 bls. gluestock.
Transatlantic Animal By-Products Corp., Gdynia, Rio Grande, 734 bags sheet hide glue.

CASEIN

F. H. Paul & Stein Bros., Mormacisle, Buenos Aires, 500 bags (granulate lactic) 25,250 kilos.
Casein Co. of America, Div. The Borden Co., Gdynia, Buenos Aires, 3000 bags (ground lactic).

WOODPULP

Ryegate Paper Co., Empire Gangway, Baie Comeau, 1515 bls. unbleached sulphite pulp.

PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 27, 1947

Perkins Glue Co., Troubadour, Buenos Aires, 508 bags casein, 20,320 kilos.

BOSTON IMPORTS

WEEK ENDING DECEMBER 27, 1947

Concentra Shipping Co., Executor, Genoa, 364 bls. dark cotton rags.

Kimberly Workers Hear Safety Message

KIMBERLY, Wis. — About 1,200 mill workers attended a safety program December 23 at the clubhouse here and heard H. G. Boon, vice-president of Kimberly-Clark Corporation, say that national recognition has been given to the corporation. Mr. Boon urged the workers to make safety history in 1948. He said that there is always room for improvement in the safety movement, and that employes must continually work at safety in or to attain it. J. T. Doerfler, mill manager, also gave a brief talk.

Marathon Entertains Tots

MENASHA, Wis. — More than 900 children between the ages of two to 14 attended the fifth annual Christmas party of Marathon Corporation at Menasha High School on December 20.

Find Active Demand In Egyptian Market

WASHINGTON — The immediate outlook for United States paper in the Egyptian market is excellent, according to the Department of Commerce, based on information from the trade.

Merchants have advised that the quality of the U. S. product is appreciated, and prices of printing and writing papers, cover papers, blotting paper and various tissues, as quoted by U. S. mills, are highly competitive.

Before the war, Egypt obtained the bulk of requirements from Finland, Germany and Sweden. During the war, Canada supplied most of the newsprint, and the United States was the principal source of other types.

The trade states that about 30 percent of the writing and printing paper used in 1946 was of United States origin, and the proportion would have been very much larger if the mills had been able to execute fully, the orders placed with them. The other 70 percent came from so-called "easy currency" countries, including the United Kingdom, Czechoslovakia, Norway and Finland, but appreciable quantities were supplied also by Sweden and Canada.

New Zealand's New Mill Will Make Newsprint

WASHINGTON — Preliminary plans have been completed by the New Zealand government in cooperation with private industry, for a new pulp and paper mill in that country, to exploit recent experiments in making paper from a domestic type of pine tree.

Recent experiments with the "insignia" pine in New Zealand, it was reported to this country from official sources, indicate that enough newsprint could be produced from this domestic species to meet the country's normal requirements. Newsprint consumption was approximately 25,300 short tons in 1946, the latest reported figure, compared with 33,000 tons in the five pre-war years.

Bag paper and fine printing and writing papers also have been produced experimentally from this pine, it was said. Difficulties in obtaining paper making machinery and equipment, it was said, might hinder the development for some time, however.

Danes Get Finnish Paper In Exchange for Food

WASHINGTON—Finland will furnish woodpulp, newsprint, bag paper, cardboard, and greaseproof paper to Denmark, in exchange for foodstuffs, under a temporary agreement just concluded between the two countries, according to consular advices to this country. The agreement, signed in November, is to operate pending a regular arrangement applicable to 1948, it was stated.

TENAX FELTS ARE ECONOMICAL

SERVING THE PAPER INDUSTRY SINCE 1891

Our research and development is paying off for our customers in longer service and lower costs. If you would share in these advantages we suggest you afford us the opportunity of serving you.

LOCKPORT FELT COMPANY • NEWFANE, NEW YORK

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, December 31, 1947

A thorough study of the world newsprint shortage is to be undertaken by UNESCO by means of a survey of the domestic production of imports and exports of wood pulp, pulpwood and newsprint through its fifty-seven member nations.

Concerning this phase of the industry, the United States Department of Commerce reported that "While newsprint supplies continue inadequate, especially for small consumers, there are indications that in some sections at least the market is less tight than a few months ago. A report from a midwest field office states that while there is no marked increase in the newsprint supply, extra allotments from the mills are received by the distributors somewhat more frequently than was the case a few months ago. The tight situation in the Southern states is being alleviated by receipts from the Scandinavian countries."

United States daily newspapers consumed 338,012 tons of newsprint during November, an increase of 15.9 percent over November, 1946, and a 28.1 percent increase over November 1, 1941, according to reports from publishers. Stocks of newsprint on November 30 were adequate for thirty-three days, compared with thirty-five days for November, 1946, with thirty-seven for 1945, and with forty-four for 1941.

Canadian newsprint production for November was 364,483 tons, an increase of 0.5 percent over November, 1946, and an aggregate increase of 7.3 percent for the eleven months of 1947. Shipments to the United States during the same period totaled 3,373,119 tons, compared with 3,071,860 for the same period of 1946. The *World Paper Trade Review* reports from Canadian newsprint circles: "Profits in the Canadian pulp and paper industry," it states, "are recording new high levels, and demand for its products continues in excess of the productive capacity of the industry. Despite this record, pulp and paper stocks are currently selling at what is regarded as a low price-earnings ratio; many are selling from five to seven times prospective 1947 earnings. Prosperity of the industry is closely tied to the business trend in the United States. Although present indication is that the United States market would take all the newsprint it could get, analysts point to past history, for while the U.S. per capita consumption has shown an upward climb through booms and depressions, it also has taken some bad bumps. Current uncertainty as to the business outlook generally — not only in the U.S. but in the world—is thus being reflected in the price of pulp and paper securities as well as all other securities."

On the subject of rising costs, the same periodical reports that "Reflecting the higher prices being paid for No. 1 groundwood, dollar value of wood pulp for the first six months of this year increased about 50 percent, according to Dominion Bureau of Statistics. In 1946, the price for No. 1 groundwood averaged $57.93 a ton while during 1947 to date the price has averaged $77 a ton." Price rises of $6 per ton are scheduled for the first half of 1948 by three more leading Canadian newsprint manufacturers.

It is reported that in Norway "Large quantities of pulpwood are stranded along the banks of the rivers and cannot be floated to the pulp mills as a result of the drought. As the winter and cold weather draw nearer, the supply situation is becoming increasingly serious for several of the mills. The inadequate water supplies in the reservoirs do not allow tapping to float the timber down but must be reserved for taking care of the electric power requirements as far as possible. The pulp and paper industry also is suffering badly because of the exceedingly difficult power situation. A number of mechanical pulp mills are running with curtailed production, and several have been idle for months with little or no prospects of resuming operations in the near future. Under these conditions, there is little activity as far as new sales for delivery during the winter season are concerned, as practically all of the mills are behind in their shipping program. Some sales of mechanical pulp have been concluded, mostly for delivery during the second half of next year, but these have been mostly in modest quantities to old customers. The mills have already disposed of so much of their expected production for next year that after considering the many uncertain factors such as timber, power and fuel, chemicals, et cetera, they prefer to wait with the disposal of possible unsold balances."

In Sweden, the government has now received the report of the committee investigating the allocation of newsprint to newspaper and periodicals next year, according to the *World Paper Trade Review*. "A sharp reduction," it says, "in the supply of newsprint to Swedish newspapers and periodicals is proposed in view of the electricity shortage, and in view of the serious currency situation which makes it essential to maintain as large a paper export as possible, despite a possible cut in production. It is proposed that all newspapers and periodicals will receive a basic allocation of newsprint during 1948 corresponding to 50 percent of their 1946 consumption. For this basic ration no license will be required, and additional allocation may be obtained under license." Periodicals which mainly rely on advertisements will receive only their basic ration; light weekly magazines will receive 14 percent above the basic ration or 64 percent of their 1946 consumption; publications issued by religious movements, organs of economic or trade unions will get approximately 72 percent of 1946 consumption; technical, scientific journals, and other periodicals of similar nature will get 75 percent of 1946 consumption; daily newspapers allocation will be based on the figure of 102,000 tons compared with a 1946 consumption of 127,000 tons.

Problems of production in Sweden are much the same as those of Norway, and producers are reported very reluctant to close contracts for 1948 delivery at the present time.

In a trade agreement signed in November with Denmark, Finland arranged to provide the Danes with newsprint, woodpulp, cardboard, greaseproof paper and bags in exchange for foodstuffs.

The U.S.S.R. has allocated 400 million rubles for the construction of forty new paper mills to supply newsprint for the increased circulation of their 5600 newspapers, total circulation of which is thirty million copies.

In Britain, newspapers for the current four-month period are allocated 31 percent of their prewar consumption, periodicals 32 percent. Books have not suffered to the same extent, allocations for this purpose being 91 percent of prewar. But although some text and reference books are temporarily in print from time to time, the universities are fuller than ever and the demand for books far exceeds the supply. Thus the situation fails to improve. Free advertising circulars are ordered cut to 50 percent, effective January 1.

Of the newsprint situation generally, the United States Department of Commerce Review concisely said: "Newsprint is the only major item which is expected to continue in substantially short supply throughout 1948. It will be at least 1949 or 1950 before the new newsprint mill now under way at Childersburg, Alabama, will be in production. New newsprint machines in Canada and Newfoundland may come into production somewhat earlier. The Alaskan prospectus may or may not result in a newsprint mill, it will be at least 1950 before output could be placed upon the market. No noticeable relief is anticipated from Northern Europe newsprint production in the next couple of years."

Woodpulp

Of the 31 percent gain shown in

(Continued on page 23)

HYCAR AMERICAN RUBBER LATEX... imparts valuable properties to pulp and paper

HYCAR latex added directly to the pulp in the beater or head box, or used as an impregnant for paper, imparts valuable properties not otherwise readily obtained.

Tear and wet strength are considerably increased. Resistance to oils, solvents and chemicals is obtained, with retention of good aging properties. The addition of Hycar also insures excellent flex life and scuff resistance, and in thick papers prevents separation of the laminations.

Thus, better physical properties may be obtained in high grade pulp. In other cases the use of lower grade stock may be permitted because of improved physical properties obtained by the use of Hycar latex. Paper is made adaptable to fields where it is not now used.

Present and potential applications for papers of this sort range from wallpaper to insoles, from gaskets to leather replacement material, from shelf liners to packaging papers.

HYCAR latex is very easy to use. In most applications no vulcanization is required. Normal drying times are used. And HYCAR latex is an inherently safe material to handle. *No solvent system is needed.*

We would be glad to work with you on any problems relating to the use of HYCAR latex. For more information, please write Department HJ-1, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

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American Rubber

B. F. Goodrich Chemical Company
A DIVISION OF THE B. F. GOODRICH COMPANY

PRICES

With the elimination of price controls on paper, pulp, rags and other materials, the quotations given below once more become indicative of trends in an open market. At the moment they can be of little more, for, while some volume business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

Paper

(Delivered New York)

Standard News, per ton—

Roll, contract	$96.00	to	—
Sheets	$109.00	"	—

Kraft—per cwt.—Carload Quantities Zone A Deld. 40 lb. base wgt.

Superstandard Wrapping	$9.00	to	—
No. 1 Wrapping	6.75	"	7.50
Standard Wrapping	6.50	"	7.25
Standard Bag	6.00	"	7.00

Tissues—Per Ream 24x36 (480) 11 lb. Zone 1.

Wh. No. 1 Frd.	$1.75	to	$2.00
Wh. No. 1 M. G.	1.75	"	2.00
Wh. No. 1½	1.60	"	—
Wh. No. 2	1.55	"	—
Kraft Anti-Tar	1.38½	"	—
Kraft Unbl.	1.85	"	—
Manila No. 2	1.62	"	—

Toilet—Per Case of 100 rolls—1 M Sheets.

Unbleached	$5.50	to	$6.40
Bleached	6.50	"	7.60

Paper Towels—Per Case of 3750—Zone 1.

Wh. Jr. M'tif'd 9¼x9¼	$4.85
Br. Sr. M'tif'd 10x12	3.45
Br. Jr. M'tif'd 9¼x9¼	2.95
Br. Jr. Sgl. fold 10x10¼	3.10

Manila—per cwt.—C. l. f. n.

No. 1 Jute Tag	$14.50	to	—
Reg. Jute Manila	13.25	"	$15.50
No. 1 Manila	9.75	"	—

Boards, per ton—

News	$92.50	"	—
Chip	90.00	"	—
Sgl. Mia. Li Chip*	102.50	"	—
White Pat. Coated*	129.00	"	—
Kraft Liners 42 lb.	100.00	"	—
Binders Boards	126.00	"	—

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1: Rag Content Bonds and Ledgers—

White, Assorted Items Bonds, per cwt.

Carton	4 C't'n	Ton
100% Rag Ext. No. 1	$55.00	$50.80	$48.70
100% Rag	48.25	44.55	42.70
75% Rag	38.00	34.55	33.10
50% Rag	31.50	28.75	27.50
25% Rag	28.00	25.50	24.50

Ledgers, per cwt.

100% Rag Ext. No. 1	$54.25	$50.00	$48.00
100% Rag	$47.50	$43.90	$42.10
75% Rag	37.50	34.55	33.10
50% Rag	32.25	29.40	28.25
25% Rag	28.75	26.15	25.10

Sulphite Bonds and Ledgers—White, Assorted Items Bonds, per cwt.

No. 1	$19.25	$17.50	$17.00
No. 2	18.25	16.50	16.00
No. 4	17.50	16.00	15.25

Ledgers, per cwt.

No. 1	$20.25	$18.35	$17.60
No. 2	19.25	17.50	16.80
No. 4	18.50	16.90	16.10

Free Sheet Book Papers—White, Cased Paper

(Per cwt.)	Case	Ton
No. 1 Glossy Coated	$20.40	$19.55
No. 2 Glossy Coated	19.15	18.30
No. 3 Glossy Coated	18.40	17.60
(Per cwt.)	Case	Ton
No. 1 Antique (Watermarked)	$15.90	$15.15
No. 2 Offset	14.15 to 17.90	13.65 to 17.10
A Grade E. F.	14.90	14.25
A Grade S. & S. C.	15.40	14.65
B Grade E. F.	Nominal	
B Grade S. C.	Nominal	

Wood Pulp

Domestic mill contract prices delivered with varying freight allowances.

	Per Short	ADT
Groundwood	$75.00 to	$81.00
Unbleached Sulphite	115.00 "	117.00
Bleached Sulphite	121.00 "	130.00
Bleached Soda	120.00 "	—
Bleached Sulphate	Nominal	
Unbleached Sulphate Northern	Nominal	
Unbleached Sulphate Southern	Nominal	

Canadian Quotations

Prices delivered with varying freight allowances unless otherwise specified:

	Per Short	ADT
Select Unbleached Kraft (no freight allowance)	125.00 "	—
Reg. No. 1 Kraft	112.50 "	115.00
Unbleached Sulphite	115.00 "	117.00
Bleached Sulphite	125.00 "	135.00
Glassine Unbleached Sulphite (no freight allowance)	112.00 "	—
Bleached Soda	120.00 "	—
Groundwood	75.00 "	85.00
Siderans Pulping News	75.00 "	80.00
Hardwood and Specialty Grades	Nominal	

Swedish Quotations

On dock, Atlantic Ports

	Per Short	ADT
Bleached Kraft	170.00 to	195.00
Bleached Sulphite	175.00 "	185.00
Unbleached Sulphite	145.000 "	175.00
Unbleached Kraft	140.00 "	165.00

Finnish Quotations

On dock, Atlantic Ports

	Per Short	ADT
Bleached Sulphite	$185.00 to	—
Unbleached Sulphite	155.00 "	152.00
Unbleached Sulphate	147.50 "	—

New Domestic Cotton Cuttings

(F.O.B. Shipping Point Plus Dealer's Commission)

White Shirt	$11.50 to	—
Light Silesias	8.50 "	—
Unbleached Muslin	11.50 "	—
White Back Blue Overalls	9.00 "	9.25
Blue Overalls	8.00 "	—
Fancy Shirt	6.00 "	—
Light Percales	7.50 "	—
Light Prints	6.50 "	—
No. 1 Washables	5.00 "	—
Bleachable Khaki	7.00 "	7.50
Unbleachable Khaki	6.00 "	6.50
Cottonades	5.50 "	5.75

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.	
No. 1 Whites Repacked	$5.00 to	—
No. 1 Whites Miscellaneous	4.00 "	—
No. 2 Whites Repacked	3.50 "	3.75
No. 2 Whites Miscellaneous	3.00 "	—
Blue Overalls	3.75 "	—
Thirds and Blues Repacked	3.25 "	—
No. 1 Roofing Rags	1.90 "	2.00
No. 2 Roofing Rags	1.75 "	—
No. 3 Jute Bagging	1.60 "	—
No. 4 Brussels and hard back carpets	1.60 "	—
No. 5A Roofing Rags	1.80 "	—

New Foreign Cotton Cuttings

(Prices to Mill, F.O.B. Dock, N. Y.)

	Per 100 lbs.	
New Dark Cuttings	$5.50 to	$5.75
New Mixed Cuttings	6.25 "	6.50
Light Silesias	9.25 "	9.50
Light Flannelettes	9.25 "	9.50
New White Cuttings	12.00 "	—
New Unbleached Cuttings	12.25 "	—
Fancy Shirt Cuttings	6.50 "	7.00
Light Prints	7.75 "	8.00
Bleachable Khaki, No. 1	7.00 "	7.50
Unbl. Khaki, No. 1	6.25 "	6.75

Old Foreign Rags

(Prices to Mill, f.o.b. dock, N.Y.)

	Per 100 lbs.	
No. 1 White Linens	$14.00 to	16.00
No. 2 White Linens	12.00 "	13.00
No. 3 White Linens	8.00 "	9.00
No. 4 White Linens	8.00 "	9.00
No. 1 White Cottons	10.00 "	12.00
No. 2 White Cottons	8.00 "	9.00
No. 3 White Cottons	6.50 "	7.00
No. 4 White Cottons	5.00 "	5.50
Extra Light Prints	7.50 "	8.00
No. 1 New Light Prints	6.25 "	6.75
Med. Light Prints	5.25 "	5.75
Dutch Blue Cottons	5.25 "	5.50
Checks and Blues	4.00 "	4.25
Linsey Garments	3.00 "	3.75
Dark Cottons	2.50 "	2.00
Old Shopperies	2.50 "	3.00
New Shopperies	2.50 "	3.00

Bagging

(Prices to Mill, f.o.b. N. Y.)

	Per 100 lbs.	
Foreign Gunny, No. 1	$5.50 to	$5.75
Domestic Gunny, No. 1	6.25 "	6.50
Light Wool Tares	5.75 "	6.25
Heavy Wool Tares	5.75 "	6.25
No. 1 Scrap Bagging	5.50 "	5.75
Foreign Manila Rope	6.00 "	6.75
Domestic Manila Rope	5.75 "	6.50
Jute Strings	4.50 "	5.00
No. 1 Sisal Strings	5.50 "	6.00
Mixed Strings	1.75 "	2.50
Mixed Strings, Outthrows	.90 "	1.10

Waste Paper

Base Prices to Mills for Average Packings

(Dollars Per Ton)
F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	135.00 to 165.00
No. 1 Hard White Envelope Cuts	145.00 " 155.00
No. 1 Hard White Shavings, unruled	145.00 " 155.00
No. 1 Hard White Shavings, ruled	110.00 " 130.00
Soft White Shavings, one cut	145.00 " 155.00
No. 1 Soft White Shavings	135.00 " 145.00
Soft White Shavings, Misc.	125.00 " 135.00
No. 1 Fly Leaf Shavings	45.00 " —
No. 1 Groundwood Fly Leaf Shavings	30.00 " —
No. 1 Heavy Books & Magazines	27.00 " —
Mixed Books	15.00 " 20.00
No. 1 White Ledger	85.00 " 90.00
New Manila Envelope Cuttings, one cut	100.00 " 110.00
New Manila Envelope Cuttings	65.00 " 75.00
Extra Manilas	25.00 " 30.00
Mixed Kraft, Env. & Bag Cuttings	75.00 " 85.00
Kraft Envelope Cuttings	110.00 " —
Triple Sorted, No. 1 Brown Soft Kraft	65.00 " 75.00
New Kraft Corrugated Cuttings	85.00 " 90.00
No. 1 Assorted Old Kraft	55.00 " 60.00
New Jute Corrugated Cuttings	27.00 " —
Old 100% Kraft Corrugated Containers	45.00 " 50.00
No. 1 News	13.00 " 15.00
No. 1 Mixed Paper	11.00 " 13.00
Box Board Cuttings	12.00 " 14.00
White Blank News	75.00 " 80.00
Overissue News	18.00 " 20.00
Old Corrugated	25.00 " 26.00
Mill Wrappers	22.00 " 25.00

Twines

All Prices Nominal, F.o.b. Mill

(Soft Fiber)

Coarse Polished—India	.28½	to	.29½
Fine Polished—Fine India	.31½	"	.36½
Unpolished—Paper Makers	.24	"	.25½
Tube Rope	.24½	"	.26½
Wrapping	.30	"	.32
Cotton	.55	"	.70

(Hard Fiber)

Mex. Sisal	.21	"	.31
Manila (Reprocessed)	.28	"	.30

(American Hemp)

Polished Hemp	.36½	"	.42
Unpolished	.29½	"	.34

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—			
New White No. 1	.11	to	.12
New White No. 2	nominal		
Light Silesias	.07½	"	.08
Black Silesias, soft	.06½	"	.07
New Unbleached	.10½	"	.11¼
Washable Prints	.06½	"	.07
Washable No. 1	.05	"	.05½
Blue Overall	.07½	"	.08
Cottons—According to grades—			
Washable Shredding	.03½	"	.04
Fancy Percales	.06¼	"	.07¼
New Black Soft	nominal		
Khaki Cuttings—			
Unbleachable Cotton Cuttings	.06	"	.06½
Bleachable Cotton Cuttings	.07	"	.07½
Men's Corduroy	.05½	"	.06
Ladies' Corduroy	.05	"	.05½
Cottonades	.05½	"	.06

Domestic Rags (Old)

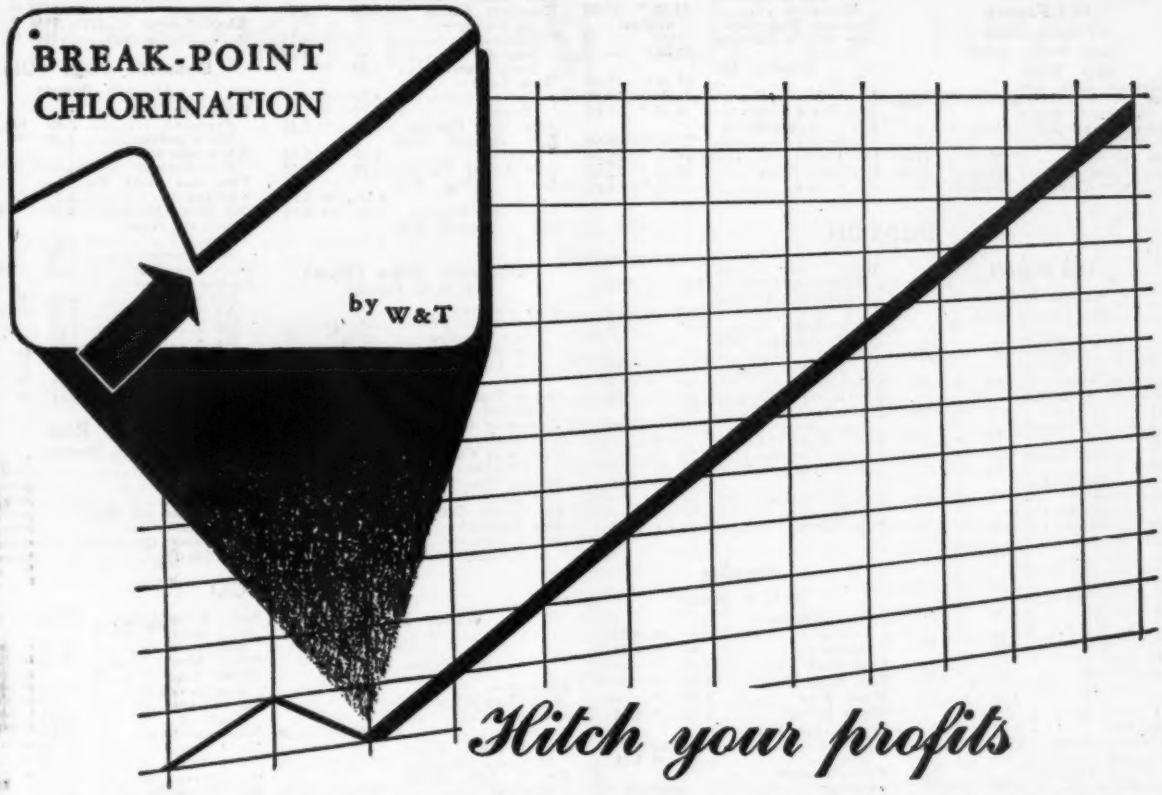
(F.O.B. Eastern Shipping Point)

White No. 1—Repacked	4.50	to	5.00
Mixed White	4.00	"	4.25
White No. 2—Repacked	3.50	"	3.75
Thirds and Blues—Miscellaneous	2.25	"	2.50
Repacked	2.75	"	3.00
Roofing Stock—Foreign No. 1	nominal		
Domestic No. 1	1.85	"	1.90
Domestic No. 2	1.75	"	1.80
Roofing Bagging	1.65	"	1.70
Old Manila Rope	6.25	"	6.50

Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—Foreign	nominal		
Domestic	4.75	to	5.25
No. 1 Clean Bright—Sisal Strings	.04	"	.04½
No. 2 Clean Bright—Sisal Strings	.03	"	.03½
Sisal Jute	.02¾	"	.03
Scrap—No. 1	4.25	"	4.75
No. 2	1.75	"	2.00



Hitch your profits

TO THE BREAK-POINT CURVE

Slime problems need no longer hold profits down—be a troublesome and costly factor in paper making. The off-quality, breaks, stock losses and other profit-consuming effects of slime can now be controlled or eliminated by Break-Point Chlorination. As the Break-Point curve goes up from the "break-point"—indicating free residual chlorine in the system—so, too, do profits go up when this proved method of slime elimination is used.

With today's increased labor and material costs, these avoidable losses are consuming an ever greater percentage of operating profit. As a result you'll find now more than ever before that the Break-Point Process applied to your fresh water system, together with chloramine treatment and other chemicals for other phases of your system, will give you never-before-possible savings economically—effectively—and simply. You'll find, too, that W & T Chlorination Specialists with over thirty years' experience in water treatment will be glad to make recommendations without obligation and that they are able to draw from a full line of Visible Vacuum Chlorinators—the standard of precision chlorination—exactly the right equipment to fit your particular needs.

Call or write today for details on Wallace & Tiernan Engineered Slime Control Processes.

WALLACE & TIERNAN
COMPANY, INC.
MANUFACTURERS OF CHLORINE AND AMMONIA CONTROL APPARATUS
NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

I-1

Wool Tares, heavy...	4.75	"	5.00
New Burlap Cuttings	6.00	"	6.50

Old Papers

(F. o. b. Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00	to	$115.00
No. 1 Hard White Shavings, unruled..	100.00	"	—
Soft White Shavings, one cut	90.00	"	95.00
White Blank News..	70.00	"	75.00
Soft White Shavings.	80.00	"	—
No. 1 White Ledger.	80.00	"	85.00
Ledger, Colored	67.00	"	70.00
No. 1 Heavy Books & Magazines	24.00	"	26.00
Overissue Magazines..	nominal		
New Manila Envelope Cuttings	80.00	"	—
No. 1 Assorted Old Kraft	60.00	"	65.00
No. 1 Mixed Paper..	11.00	"	12.00
Box Board Cuttings..	10.00	"	11.00
Kraft Corrugated Cuttings	90.00	"	100.00
Old Corrugated	24.00	"	26.00
Overissue News	20.00	"	22.00
No. 1 News	13.00	"	15.00

BOSTON

Old Papers

(F.o.b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled..	6.25	to	6.75
No. 1 Hard White Shavings, ruled	6.00	"	6.50
Soft White Shavings, Misc.	5.25	"	5.50
No. 1 Fly Leaf Shavings	1.75	"	1.85
No. 2 Fly Leaf Shavings	1.65	"	1.75
No. 1 Groundwood Fly Leaf Shavings	1.75	"	2.00
No. 2 Groundwood Fly Leaf Shavings	1.50	"	1.75
Mixed Colored Shavings	2.00	"	2.25
New Manila Envelope Cuts, one cut	4.50	"	4.75
Hard White Envelope Cuts, one cut	6.00	"	6.50
Triple Sorted No. 1 Brown Soft Kraft.	3.75	"	4.00
Mixed Kraft Env. & Bag Cuttings	4.00	"	4.25
Kraft Envelope Cuttings	3.75	"	4.00
No. 1 Heavy Books & Magazines	1.25	"	1.75
New Manila Envelope Cuts, one cut	—	"	—
New Manila Envelope Cuttings	4.00	"	4.25
White and Colored Tabulating Cards ..	4.00	"	4.50
Groundwood Tabulating Cards	1.50	"	1.75
White Blank News..	2.25	"	2.50
No. 1 Assorted Old Kraft	3.50	"	—
No. 1 Mixed Paper..	.65	"	.75
Overissue News	1.00	"	1.25
Box Board Cuttings..	.60	"	.70
New Corrugated Cuttings, Kraft	2.75	"	3.00
Old Kraft Corrugated Containers ..	1.75	"	—
Old Corrugated Containers	1.10	"	1.25
Jute Corrugated Cuttings	1.07½	"	—
Paper Strings	2.00	"	2.25

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	—	to	4.75
Domestic	—	"	4.75
Sisal Rope No. 1	6.00	"	—
Sisal Rope No. 2	5.50	"	—
Mixed Rope	5.25	"	—
Mixed Strings	2.00	"	2.50
Transmission Rope—			
Foreign	(nominal)		
Domestic	3.00	"	3.50
Manila Rope—			
Foreign	(nominal)		
Domestic	6.25	"	—
Soft Jute Rope	5.00	"	5.25
Jute Carpet Threads.	6.00	"	—
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	—	"	4.75
Domestic	—	"	4.87½
South America	5.25	"	—
Wool Tares—			
Foreign	4.75	"	—
Domestic	4.75	"	—
Aust. Wool Pouches..	5.00	"	5.25
New Zealand Wool Pouches	5.25	"	5.50
New Burlap Cuttings	6.00	"	6.50
Heavy Baling Bagging	5.25	"	5.75
Paper Mill Bagging..	3.50	"	3.75
No. 1 Roofing Bagging	1.75	"	—

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints.	.08	to	—
Fancy Percales	.07½	"	.08
New White No. 1..	.11	"	.11½
New Light Flannelettes	.08	"	.08½
Canton Flannels, Bleached	.10	"	.11
Underwear Cutters, Bleached	.10	"	.11
Underwear Cutters, Unbleached	.11	"	.12
Silesias No. 1	.08	"	.08½
New Black Silesias..	.05	"	—
Red Cotton Cuttings.	.05	"	—
Blue Overalls	.08½	"	.09
Soft Unbleached	.11	"	.12
Blue Cheviots	.08½	"	.09
Fancy	.06	"	—
Washable	.06	"	—
Khaki Cuttings	.06½	"	.07½
Corduroy	.63½	"	—
Khaki Canvas	.06½	"	.06½
B. V. D. Cuttings	.10½	"	.11½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	to	—
Miscellaneous	3.20	"	—
White No. 2—			
Miscellaneous	2.65	"	—
Twos and Blues, Repacked	2.20	"	—
Old Blue Overalls	2.25	"	2.50
Thirds and Blues, Repacked	2.20	"	—
Miscellaneous	1.80	"	—
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	2.00	"	—
No. 2	1.75	"	2.00
No. 3	1.35	"	—
No. 4	1.35	"	—
No. 5, Quality A..	1.35	"	—
Quality B..	1.20	"	—
Quality C..	.95	"	—
Old Manila Rope	6.00	"	—

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	$110.00	to	$120.00
No. 1 Hard White Shavings, unruled..	105.00	"	115.00
No. 1 Soft White Shavings	80.00	"	95.00
No. 1 White Ledger..	55.00	"	65.00
No. 1 Heavy Books & Magazines	40.00	"	43.00
White Blank News..	65.00	"	—
Mixed Kraft Env. & Bag Cuttings	75.00	"	85.00
No. 1 Assorted Old Kraft	45.00	"	55.00
Overissue News	28.00	"	—
No. 1 News	17.00	"	19.00
No. 1 Mixed Paper..	13.00	"	14.00
Old Corrugated	25.00	"	27.00
Mill Wrappers	22.00	"	—

MARKETS

BLANC FIXE—Market unchanged. Supplies tight. Pulp is currently quoted at $85 in bags, car lots at works, 6 cents per lb., l.c.l., deld.; by-product $72.50 per ton, car lots at works, 6 cents per lb., l.c.l., deld.

BLEACHING POWDER—Active demand. Market continues tight. Shortage of metal containers. Prices range from $3.75 to $4 per 100 pound drums, l.c.l., works.

CASEIN—Market strong following price rise. Stocks diminished. Current prices on processed acid precipitated casein at 32 to 34 cents per pound for domestic grades and 30 to 32½ cents for imported grades, f.o.b. shipping point.

CAUSTIC SODA—Sustained strong demand against insufficient production. Grey market active. Solid caustic is reported at $2.85 per cwt.; flaked and ground is quoted at $3.25 per cwt. in 400 pound drums, $3.75 per cwt. in 100 pound drums—car lots at works; liquid 50% in tank cars at $2.25 per cwt.; liquid 73% in tank cars at $2.35 per cwt. at works.

CHINA CLAY—Domestic grades in good supply. Market steady. Domestic filled clay is currently $10 to $13 per ton, car lots, coating clay is $15 to $30. Imported clay demand good. Supply improved. Quoted $16 to $35 short ton export warehouse.

CHLORINE—Supply condition unimproved despite increased production. Tank car shortage hampering movement. Demand sustained. Scarcity is diverting orders to substitutes such as bleaching powder, ferric chloride, et cetera. Prices unchanged. Currently quoted at $2.25 per cwt. in single unit tank cars, and at $2.55 to $3.75 per cwt. in multi-unit tank cars, f.o.b. works.

ROSIN—Demand suspended temporarily. Prices rising. Gum rosin in drums per 100 pounds net in yard, New York car lots B, D, $9.75; E, $10.50; F, G, H, I, K, M, N, $11; WG, $11.05; WW, $11.15. Wood rosin, per 100 pounds, net, f.o.b., l.c.l., N. Y., B, $6.45; FF, $7.95; G, H, I, K, M, $10.22; N, $10.27; WG, $10.75; WW, $10.86; X, $10.96.

SALT CAKE—Demand continues ahead of supply with slight improvement in shipments. Prices remain unchanged. Domestic salt cake is quoted at $20 to $26.

SODA ASH—Demand increased. Market tight. Shipments only against contracts. Mills substituting sodium bicarbonate to relieve situation. Current prices, car lots, per 100 pounds, are as follows: in bulk, $1.10; in paper bags, $1.30; and in barrels, $1.80.

SODIUM BICARBONATE — Supply approximately abreast of demand. Shortage of box cars delays shipment. Reported at $1.85 per cwt. paper bags, carload lots.

STARCH—Prices strong and unchanged. Market active both domestic and export. Production at capacity applied on former orders. Market sold well ahead. Pearl grade quoted at $7.02 per 100 pounds, powdered starch at $7.13 per 100 pounds, car lots, New York.

SULPHATE OF ALUMINA — Supply steady. Prices unchanged. The commercial grades are quoted at from $1.15 to $1.30 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is quoted at $2 per 100 pounds in bags, car lots, at works.

SULPHUR — Demand steady. Supplies ample. Annual contracts are quoted at $16 to $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf ports is $17.50 to $19.50 per long ton.

TALC—No change in domestic market. Demand far in excess of supply. Domestic grades are currently quoted at $21 per ton in mines; Canadian at $35 and up per ton. All prices in car lots.

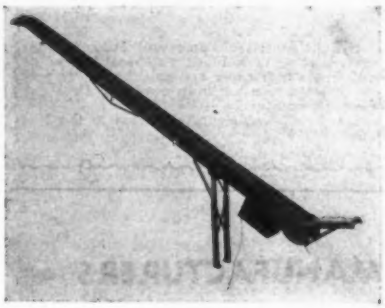
TITANIUM DIOXIDE — Extremely tight supply with no easing seen. Demand strong. New prices Jan. 1: anastase 17½c lb. carload lots, 18-18½c l.c.l.; rutile 19½c lb. carload lots, 20-20½c l.c.l.; 50-lb. bags, f.o.b. plant, minimum freight allowance.

EQUIPMENT AND SUPPLY NEWS

Rapids-Standard Markets Floor-Veyor, Jr.

GRAND RAPIDS, Mich.—A new standardized multi-purpose power belt conveyor, the Floor-Veyor, Jr., is described by the Rapids-Standard Company, Inc., material handling equipment manufacturers of Grand Rapids, Michigan, as a low cost conveyor designed primarily for moving medium weight loads between floors or horizontally, supplementing the regular heavy duty standard Floor-Veyor power belt conveyor.

The frame of the new unit is light in weight, yet unusually strong because of the design of the cross section. It is formed with provisions for attaching legs, ceiling supports, and accessories such as guard rails or sorting tables when used horizontally.



Floor-Veyor, Jr.

Built in lengths which are multiples of 2½ feet up to 30 feet, the new Floor-Veyor, Jr., may be remodeled by a purchaser to meet a changing need by addition or removal of standardized sections of conveyor bed and lengthening or shortening of the belt. Units over 11 feet in length are built in two sections, over 21 feet in three sections. Trussing is supplied with all units over 16 feet to provide additional strength at the joints.

Inquiries should be sent to The Rapids-Standard Company, Inc., Dept. FJ-212, 342 Peoples National Bank Building, Grand Rapids 2, Michigan.

Boiler Water Level Control Reviewed in Northern Equipment's Bulletin 473

ERIE, Pa.—This 8-page booklet is a Copes Performance Report on Northern's recently completed project at the Municipal Power Plant, City of Monroe, Louisiana. The story is concisely and graphically told by means of good photographs and drawings, as well as through pithy descriptions of the equipment and significant data. Copies available through Northern Equipment Company, Erie, Pa.

Komline-Sanderson Filter Mobilized for Demonstration

RIDGEWOOD, N. J. — Successful tests of its cord filter in the dewatering of a wide range of sewage sludges, industrial wastes and chemical slurries have encouraged the Komline-Sanderson Engineering Corporation, Ridgewood, N. J., to construct a trailer-mounted unit which it has made available for demonstrations anywhere under actual plant conditions.

Advantages revealed by tests to date include continuous, non-clogging action, with filter medium cleaned automatically at each revolution. Drum construction is extremely simple, and filtrate pipes are located outside the drum for easy maintenance. Replacement cord may be wound on the drum while the unit is filtering, saving much of the time usually lost in maintenance or replacement of filter medium. The output of filter cake is constant, affording easier control and improved efficiency when the cake is subjected to further processing.

Spaces between cords (which are arranged in two layers running in one direction only) provide the porosity for filtration, and are equivalent in capacity to the interstices of ordinary fabric or mesh filter media. The construction does away with false bottoms, screens, and wire winding, and produces a dryer cake. Cake discharge is also improved. In the Komline-Sanderson unit the cake never surrounds the cords of either set. Fines that usually penetrate conventional filter fabrics are washed off the cords in the course of the automatic operation.

The portable cord filter which Komline-Sanderson has made available for field demonstrations is a complete vacuum filtration unit of 4′ x 4′ size, equipped with a sludge pump, coagulant mixing tank, vacuum pump, and coagulant mixing pumps. Demonstrations may be arranged by contacting the Komline-Sanderson Engineering Corporation, Ridgewood, New Jersey.

The Cord Filter Demonstration Unit of Komline-Sanderson Engineering Corporation

TRENDS

(Continued from page 18)

November pulp imports, sulphite grades reflected the largest portion with a 96 percent increase over November, 1946, sulphite grades showing only 18 percent gain for the same period. Imports from Canada were 114,030 tons for November, 1947, an increase of 10 percent over November, 1946; from Sweden 32,170 tons against 10,663 in the previous November; from Finland 35,882 against 20,161 tons. Canada as the chief supplier shows an aggregate gain for the eleven months of 1947 of 18.6 percent.

Market undertone was firm although little activity was apparent because of the holiday atmosphere. The limited amounts of available pulp were inadequate for requirements, sulphite being in particularly short supply.

Waste Paper

Trading in the New York market was at low ebb. Prices nevertheless remained firm on high grades and steady for bulk ones. It is expected that considerable effect will be felt from the heavy storm as it halted collections throughout the area. It is reasonable to expect that the heavy stocks will be taken up and the market become firmer. Predictions are that the demand will continue strong for sulphite and sulphate grades of paper stock throughout 1948 while the shortage of high-grade pulp continues; also for groundwood substitutes such as news blanks; but that the demand for lower grades and corrugated may taper sometime during the second quarter when an oversupply of these grades may exist. Chicago's market is reported fairly strong with steady demand and firm quotations.

Index

The index of general business activity for the week ended December 20 declined to 155.8 from 156.4 in the previous week, compared with 145.7 in the corresponding week of 1946.

Paper production for the week ended December 20 was estimated at 107.2 percent, compared with 110.1 (revised figure) for the preceding week, with 101.8 for the corresponding week of 1946, with 96.5 in 1945, and with 70.0 for the corresponding week of 1944.

Paperboard production for the week ended December 20 was 100.0 percent of capacity, compared with 100.0 for the preceding week, with 102.0 for the corresponding week of 1946, with 92.0 for 1945, and with 88.6 for the corresponding week of 1944.

DIGESTED

We, as a group, must continue to live up to our ideals—to achieve our goals—to realize our dreams. Today the peoples of many nations are in the iron grips of despair and fear. People without sufficient food, without sufficient clothing, without adequate homes, far outnumber those who possess the necessities of life. We in America, and more particularly those of us here, do have a hope and a belief in the future. In part, this hope and this belief is due to our past successes.

We can meet the problems of the coming year because we have faith in ourselves, in the things we do, and in the way we do them. We have the courage to face world problems and to aid our fellow men across the many seas—because we fight with the weapons of men who can produce more for a world that needs so very much. These are the weapons of free men.

And so as the year draws to a close and the Christmas spirit unites men of goodwill everywhere, I want to wish you and your families a very Merry Christmas. I hope that we can bring to the New Year and to ourselves that happiness which comes from courage, progress, and above all from freedom.—HARRY H. STRAUS, President, ECUSTA PAPER CORPORATION.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1947		Corresponding Weeks—1946	
November 15	109.1	November 16	104.9
November 22	111.9	November 23	104.6
November 29	107.4	November 30	103.0
December 6	112.1	December 7	106.6
December 13 (Revised)	110.1	December 14	106.7
December 20	*107.2*	December 21	101.8

COMPARATIVE MONTHLY SUMMARIES

1946				1947			
Jan.	94.7	July	94.0	Jan.	102.1	July	93.5
Feb.	98.4	Aug.	104.7	Feb.	105.9	Aug.	104.2
Mar.	104.4	Sept.	101.3	Mar.	106.1	Sept.	102.0
Apr.	102.7	Oct.	106.4	Apr.	105.1	Oct.	109.5
May	100.7	Nov.	105.5	May	106.2	Nov.	*109.3*
June	104.6	Dec.	97.0	June	106.0		
		Avg.	101.1				

COMPARATIVE YEARLY SUMMARIES

	1940	1941	1942	1943	1944	1945	1946	1947
Year to Date	86.1	97.3	90.7	88.1	88.6	89.9	101.6	*104.9*
Year Average	85.6	97.4	90.4	87.8	88.1	89.4	101.1	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1947		Corresponding Weeks—1946	
November 15	101	November 16	101
November 22	102	November 23	100
November 29	93	November 30	94
December 6	98	December 7	99
December 13	100	December 14	102
December 20	*100*	December 21	102

Year	Jan.	Feb.	Mar.	Apr.	May.	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1946	90	91	100	99	94	97	89	95	96	100	99	92	96
1947	99	103	101	100	101	101	90	99	96	101	99		

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

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Make Great Atlantic in New York your Eastern Sales Headquarters.

EDITORIAL

—and Statistics

While it is comforting to know that the Federal Trade Commission, as of December 27, finds itself able to report on the ratio of profits to stockholders' equity for the second quarter of 1947, a good deal of intelligent attention to the grouping of the Commission's statistics still is to be desired. It may serve the convenience of the Government Bureau concerned with such matters to be able to group under a single heading "paper and allied products." But surely a six-months interval should also give enough leeway to allow a more thoughtful classification of the industry. For a more thoughtful grouping is much to be desired than the simple use of a formula which is based on the handling of a cellulose product as the common denominator.

Paper and allied products, says the Commission, retained first place as the industry with the highest ratio of profit to stockholders' equity. This might well be something to be proud of if it represented the experience of a true cross section of the industry. But there is no such thing as a true cross section where so many diverse types of operation are gathered under a frankly general heading. Included in the class are those large operations which require heavy investment in plant and inventory, and those where investment needs are relatively light as compared with the productive capacity of a converting operation. On one side of the picture would be grouped those large enterprises which must be large and soundly financed to turn out the production records that the paper and pulp mills have marked up this year. On the other side would be the alert selling operation which makes its profits from its ability to buy as it needs, to add value in the process of its own operations, and to distribute quickly. On the one hand we may have a pulp mill which can turn its inventory—its year's stock of pulpwood—over but once a year. On the other hand we may have a fast working operation that may be able to turn its purchased materials into billed shipments once a month, and at a considerably lessened need for capital. The two methods of operation are comparable in no way for group purposes. On the other hand they produce figures reminiscent of the old definition of three kinds of lies.

Quarterly returns on stockholders' equity for paper and allied products industries as a group, according to the F.T.C. showed for the second quarter a rate of 9.6 before Federal taxes and 5.9 after taxes, compared with 10.4 and 6.4 rates reported in the first quarter, said the report. In profits per dollar of sales, the group showed for the second quarter, 18.1 cents before Federal taxes, and 11.2 cents after taxes, compared with the first quarter showing of 19.6 cents before Federal taxes and 12 cents after taxes.

For the second quarter, said the report, aggregate sales for all American manufacturing corporations are estimated to have increased 4.2 percent over the first quarter. However, this increase was more than offset by a proportionately larger increase of 5.8 percent in costs and expenses, with a resultant decrease in aggregate profits before taxes of 6.9 percent.

Canada Adds Up

Canada turns the calendar as the year closes and finds itself in the satisfactory position of being a strong bidder for United States dollar exchange. The backbone of its exportable wealth comes from its forests and is in extremely heavy demand on this side of the border in the form of woodpulp and newsprint, and indications point to a strong continuing demand. Canada's pulpwood cut so far this year is reported to be up 27 per cent over last year's cut at this time of the cutting season. On this basis the 1947-48 cuts are expected to run as high as 12 million cords, providing, of course, that operations are maintained at the present levels.

It is reported, however, that some companies may reduce woods operations in the new year. Last year many companies maintained full crews throughout the winter, when deep snow normally curtails cutting operations. Since most companies this year are ahead of schedules, some cut-back may be possible during the poor cutting months.

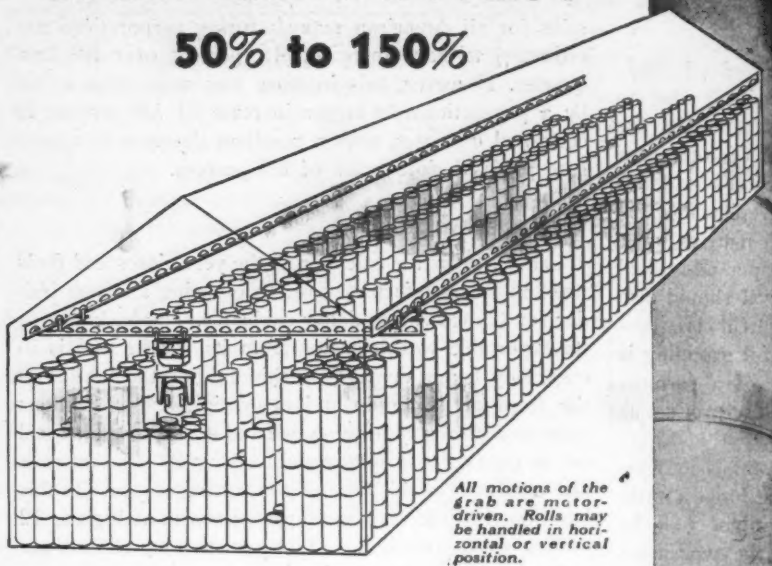
Improvement in the pulpwood supply is the direct result of the larger working force. Since the middle of August the total of woods workers has increased and it is estimated that there are now 25 per cent more workers than last year at this time. Approximately 3,000 displaced persons have gone to the woods and more are expected.

The newsprint situation would appear to be favorable to Canadian mills during the coming year. Total production for the 11 months, up to the end of November for all Canadian newsprint mills amount to 4,077,864 tons, while shipments during November were up 5 per cent over the same month a year ago. At the same time stocks in the hands of all North American manufacturers declined by 27,092 tons in November.

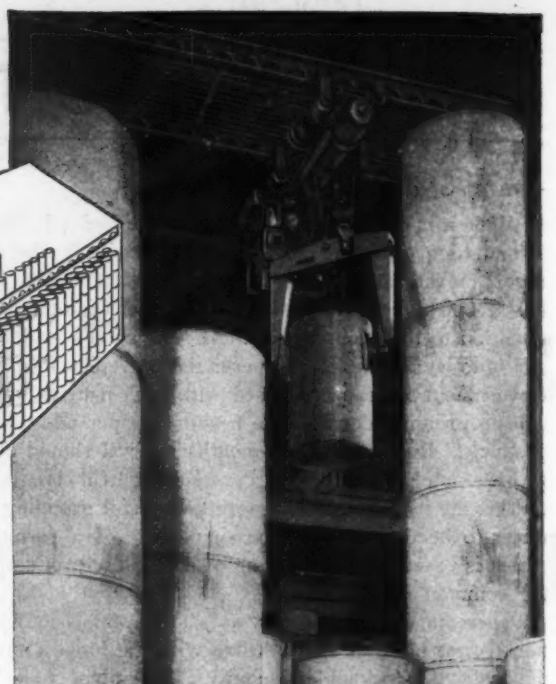
On the other hand, from the Canadian point of view, it is interesting to note the various grades of paper for which U. S. capacity will be increased next year. These include kraft and sulphite wrapping papers, book papers, tissue papers, fine papers, groundwood papers, paper board. These increases in U. S. capacity assume added importance in the light of tariff agreements concluded at the Geneva Conference.

W. L. Cook
Editor

INCREASE ROLL STORAGE CAPACITY 50% to 150%



All motions of the grab are motor-driven. Rolls may be handled in horizontal or vertical position.

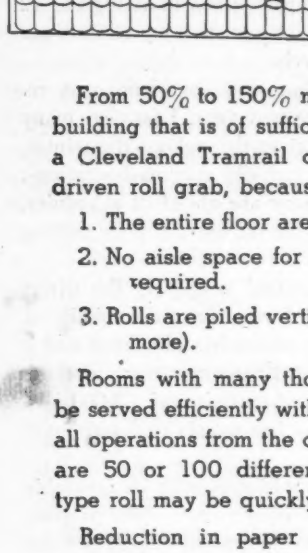


From 50% to 150% more rolls can be stored in a building that is of sufficient height to accommodate a Cleveland Tramrail overhead crane and motor-driven roll grab, because:

1. The entire floor area is utilized.
2. No aisle space for floor handling equipment is required.
3. Rolls are piled vertically 6 or 7 high (42 feet or more).

Rooms with many thousands of rolls can usually be served efficiently with only one man who handles all operations from the crane cab. Even where there are 50 or 100 different paper classifications, any type roll may be quickly stored or retrieved.

Reduction in paper spoilage is another of the many advantages of the Cleveland Tramrail method. In some plants this means a savings of 1% of all paper handled.



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OF THE PULP AND PAPER INDUSTRY

122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

Engineering Studies in Packings*

By H. G. Koch[1]

Abstract

The life of pump packings and gaskets can be extended considerably, and overall packing costs can be reduced, if packings are correctly installed and intelligently serviced.

For a packing to fulfill its primary function of controlling leakage, it (1) must be so disposed as to form a continuous barrier against leakage, and (2) must contact the mating equipment surfaces with a unit pressure in excess of the fluid pressure to be sealed. After the packing has been installed and placed under pressure by the customary threaded studs, the contact pressure gradually decays. Eventually the leakage will reach an unacceptable level, and the packing must be readjusted. The decay of pressure may be caused by plastic flow, loss of material by wear, thermal contraction, or deterioration of the packing by the fluid handled.

Maximum life and minimum costs can be realized by installation of the packing in such a way as to eliminate voids in the stuffing box, and by permitting as much leakage as possible in subsequent operation.

So much has already been written on the subject of packing installation and operation, that another such article might appear to be superfluous. The fact remains that incorrect handling of packings still results in substantial economic losses in many plants. Without further apology the object of this paper is to enable plant operators to save dollars and cents in packing and maintenance costs by observing a few simple precautions on the installation and handling of packings.

The behavior of a gasket between two flanges, or of a packing in the stuffing box of a pump, is rather complex from an engineering point of view. Practically speaking, however, there are only two basic conditions which must be fulfilled for satisfactory sealing, namely: (1) the packing material must be in the right place, and (2) it must contact the mating equipment surface with a certain minimum unit pressure.

These two conditions, which are herein termed the "barrier" and "contact pressure" conditions respectively, will now be discussed in greater detail before the more practical considerations are covered.

* Presented at the Second Engineering Conference sponsored by the Technical Association of the Pulp and Paper Industry held at The Bellevue-Stratford, Philadelphia, Pa., Nov. 3-5, 1947.

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The "Barrier" Condition

In order for a packing or gasket to fulfill its primary function of controlling the leakage of a fluid, the packing material must obviously be so arranged that it presents a complete barrier to the passage of the fluid. If this condition is not fulfilled, leakage will take place in one of two ways: (1) through the packing material itself, or (2) between the packing material and the mating equipment surfaces.

Leakage through the packing or gasket material is ordinarily not of sufficient magnitude to present any problem. Although all soft packings contain varying amounts of void spaces or pockets of sizes ranging from a few thousandths of an inch in major dimension down to submicroscopic dimensions, these voids are usually not interconnected and do not give rise to objectionable leakage. In exception to this generality, it may be mentioned that gasket materials designed for service against strong acids or other chemicals must be selected with a view to minimum porosity since the rate of attack of the gasket by the corrosive fluid depends in part upon the diffusion or rate of seepage of the fluid through the structure.

The more common path of leakage is found between the packing and the mating equipment surfaces. Any through-channel will obviously permit leakage in an amount determined by the dimensions of the passage, viscosity of the fluid, and pressure drop along the channel. The through-passage is usually the result of poor conformance between the packing and the equipment either when first installed or after service begins. For example, if a flange is warped out of plane to a greater dimension than the average linear compression of the gasket material under maximum bolt load the "barrier" condition cannot be set up, and the flange joint will leak under the first application of pressure. Again, if a valve stem packing is installed on a stem having a slight taper, the packing may seal when the valve is nearly closed but may leak heavily when the valve is opened wide because the diameter of the part of the stem then under the packing is less than that of the packing itself.

The "Contact Pressure" Condition

It is a necessary condition for sealing that a packing provide an uninterrupted barrier to leakage, but this condition in itself is not sufficient. It is also necessary that the contact unit pressure between the packing and the equipment surfaces at least equal,

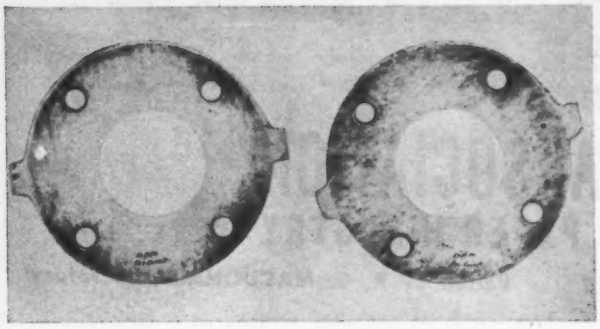

FIG. 1
Carbon Paper Print Showing Pressure Distribution on 1/64 inch Thick (Left) and 1/16 inch Thick (Right) Gaskets

and preferably exceed, the pressure of the fluid.

For example, it can be shown by experiment that the pressure applied by smooth flange surfaces to a gasket is slightly higher than the fluid pressure when the fluid pressure is increased just sufficiently to produce leakage. The ratio between the gasket unit pressure and the fluid pressure is usually termed the "contact pressure ratio," and the value of this ratio should exceed unity to insure sealing. The harder the gasket and the rougher the flange and gasket surfaces, the higher will be the contact pressure ratio necessary to prevent leakage.

To illustrate the magnitude of contact pressure ratios ordinarily required for initial sealing, it may be noted that for most rubber gaskets, the ratio approaches 1.0, whereas for compressed asbestos sheet between flanges in reasonably good condition values from 2.0 to 4.0 may be required. For metallic gaskets, pressure ratios upwards of 5.0 are often necessary for sealing.

It is not necessary that every portion of the contact area between the gasket and flange be subjected to a unit pressure higher than the fluid pressure as long as the high-pressure area is so disposed that it forms a continuous band completely encircling the joint.

In the case of flange-to-gasket contact, observation of the nonuniform nature of the contact pressure can be made by placing a sheet of carbon paper and a piece of white paper between the gasket and flange face. After the joint has been made up and then disassembled, the high-pressure and low-pressure areas can be observed on the paper as shown by Dunkle *(1)*. As might be expected, the contact pressures are high near the bolt holes, but fall off considerably between the holes because of deflection of the flange. In terms of the "contact pressure" concept, it may be said that if the contour lines which connect points of contact pressure numerically equal to the fluid pressure are interrupted between the bolt holes, and are diverted either to the outside and inside periphery of the gasket, leakage will take place through the joint.

Figure 1 illustrates a typical carbon paper print showing the nonuniformity of pressure distribution on gaskets of the same material, tightened to the same bolt load, and using the same pair of flanges. The relatively poor distribution of pressure on the thinner gasket should be noted.

The Initial Conforming of Packing by Pressure

Having briefly discussed the two conditions necessary for sealing, namely that the packing must be so disposed as to constitute a continuous barrier against leakage, and that it must press against the mating parts with a contact pressure higher than the fluid pressure, consider the means whereby the above conditions are first set up when the packing is installed, and the factors which work against the maintaining of the conditions during service.

Centrifugal pump packing is generally supplied in coils or spirals and of such size that it can readily be inserted in the stuffing box. Each ring of packing must therefore be individually compressed after it is inserted so that it will completely fill the space available to it and will press firmly against the shaft and stuffing box wall. The first rings entered are usually compressed with a split sleeve, and the last few rings by the use of the packing follower and stud nuts.

In the case of gaskets, the pressure necessary to conform the gasket material and to provide pressure higher than fluid pressure, is nearly always provided by bolts. It is important (a) that the tightening be done evenly, and (b) that the bolts not be successively tightened in order around the flange, but rather across the flange (for example, Nos. 1, 4, 2, 5, 3, 6, in case of a six-bolt flange).

Molded packings, such as flat cups now frequently employed in reciprocating pumps, and as shown on Fig. 2, are designed with sufficient flare to fulfill the "barrier" condition at installation. The pressure between the cup and cylinder wall then increases directly

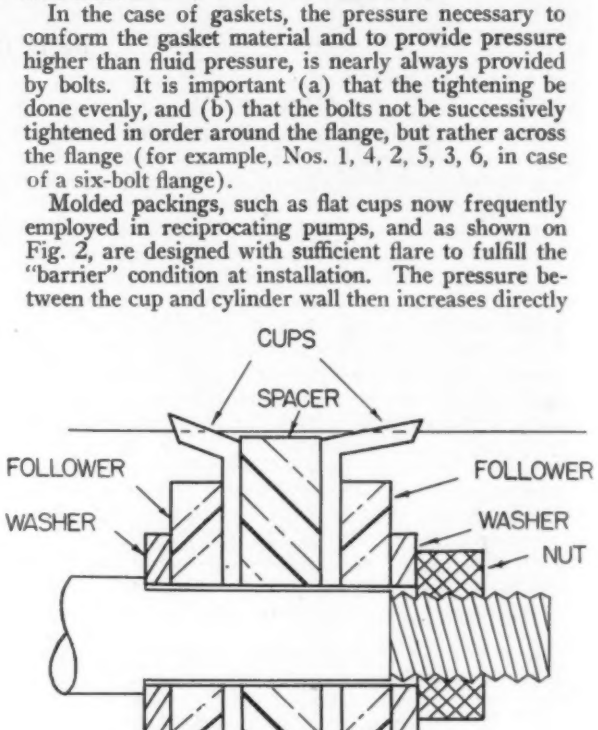

FIG. 2
Assembly of Packing Cups on Rod of Reciprocating Pump

with the fluid pressure, so that the necessary contact pressure ratio is automatically maintained.

Loss of Contact Pressure in Service

Having discussed the initial provision of packing conformance and sealing pressure, attention is directed to the factors which work against the maintenance of the original packing setting.

COLD FLOW

In the first place, there is a gradual falling off of the pressure in the packing as the result of the flow of the packing material into voids either within the packing or between the packing and mating equipment parts. This effect is accelerated by heat which may be transmitted into the packing from surround-

ing parts, or heat generated in the packing by friction against moving parts. Although this flow takes place more rapidly at high temperatures it can also be observed at normal temperatures in which case it is usually "cold flow."

A common example of this effect is the so-called "stress decay" of gasket materials in flange service, measurements of which have been made by Thorn *(2)*. It is a common observation that steam gaskets seal without trouble when first installed but tend to leak after a few days or weeks of service. This is of course caused by flow of the gasket material under heat. Since most of the flow takes place within 10 or 20 hours of service, it is good practice to take up on the flange bolts after the first day of service in order to generate a reserve of sealing pressure in the gasket material. The flanges should not be insulated in such a way as to interfere with the retightening of the bolts, or if insulation is necessary, it should not be applied until after the initial flow has taken place and the joint has been retightened.

Wear

Drop in sealing pressure may also result from wear or removal of packing material as a result of abrasion by mating parts. In the case of stuffing box packings operating against rapidly moving shafts, the packing must be readjusted at frequent intervals if it is desired to control leakage to uniform and low rates. It is obviously better to take up slightly on the packing once each day than to allow the packing to leak heavily for a week and then to apply excessive take-up in an attempt to reform the packing after the lubrication has been leached out of the packing structure and mechanical damage done to the packing surface.

It has been the author's experience that most braided and impregnated packings have completed their useful life after they have been compressed to about 75% of their original volume. By this time most of the impregnation has been lost, high packing pressures are necessary to maintain sealing, and much damage may be done to shafts and sleeves if the packings are not replaced.

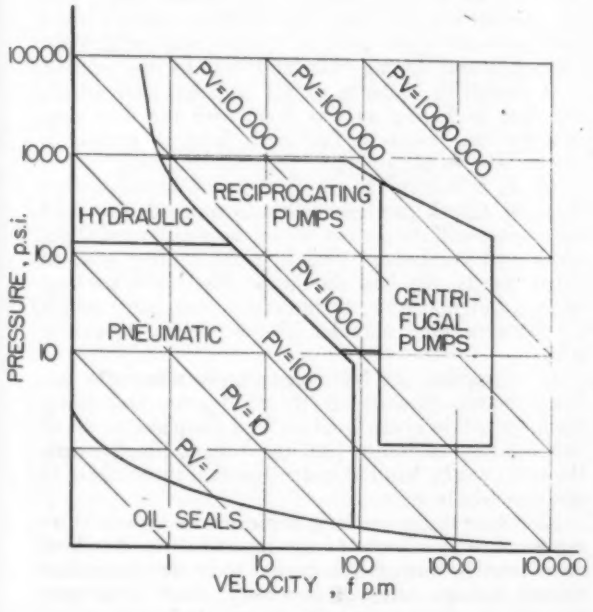

Fig. 3
Chart Showing Range of Pressure-Velocity Factors for Typical Packing Applications

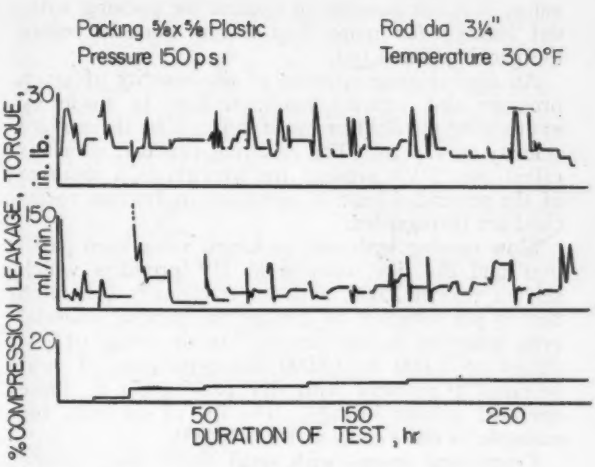

Fig. 4
Behavior of a Centrifugal Pump Packing Under Test at 3500 RPM

Thermal Contraction

Another cause of decrease of sealing pressure in packings is contraction caused by temperature changes in operation. Thus a stuffing box packing which is working at an acceptable leakage level at the time of shut-down may leak heavily when the equipment is started because the coefficient of thermal contraction of the packing material is greater than that of the surrounding metallic parts. The most generally satisfactory method of handling this particular problem is to tolerate the leakage at start-up rather than to disturb the packing adjustment since a normal leakage rate is usually attained after the packing reaches thermal equilibrium.

Chemical Attack or Solution

Finally, packing pressures may decrease as a result of severe chemical attack or solution of the packing materials by the fluid being handled. It is of course the packing manufacturer's responsibility to select suitable materials and to build into the packing structure the chemical and physical properties which are necessary to provide satisfactory operation against acids, caustic solutions, solvents, etc., and to recommend appropriate packings for the application in question. A list of materials commonly used for specific applications has been presented by Lopata *(3)*.

Leakage vs Life

All of the causes of packing leakage discussed above, namely plastic flow, wear, thermal contraction, etc., are accelerated by high operating temperatures. In order to hold stuffing box packing temperatures to a minimum it is essential that some leakage of fluid be permitted. The importance of this point can hardly be overemphasized since ample lubrication of the packing shaft interface by the fluid being sealed may reduce the coefficient of friction, and thus the generated heat, to as low as one-third of the dry value. As a result, the life of the packing may be extended by a factor of ten or even twenty. In tests described by Thorn *(4)*, it appeared that packing life varied almost directly with the permitted leakage over the range investigated. Indeed, when the fluid pressure and shaft velocity exceed a certain

value, it is not possible to operate the packing without leakage for more than a few minutes before the packing burns out.

An approximate estimate of the severity of given pressure and velocity condition may be made by multiplying the fluid pressure in p. s. i. by the surface velocity in f. p. m. The resulting product, which is called the "PV" product for brevity, is a measure of the generated heat if variations in friction coefficient are disregarded.

Slow moving hydraulic packings, valve stem packings and the like, operate at PV products which seldom exceed 2,000, and the frictionally generated heat is not sufficient to damage the packing material even when no leakage occurs. In the range of PV values of 5,000 to 10,000 the generation of heat becomes a problem with dry packings, i. e., those operated without leakage. The life of oil seals, for example, is quite short at PV=10,000.

Centrifugal pumps with small shafts may operate satisfactorily at a PV level of approximately 20,000 with leakage amounting only to a slow drip, and vegetable fiber packings such as ramie or flax have adequate temperature resistance for such service. Above PV=50,000, this type of packing requires substantial leakage (of the order of 20 ml. or 700 drops per minute per inch of shaft diameter) and above PV=100,000 the use of asbestos packings or the so-called "plastic packings" is preferred. The author's experience with rotating rod testing in the 200,000 to 300,000 PV range indicates clearly that the extruded plastic coil packings will give considerably longer service than the braided asbestos types with lower leakage rates. However, at this relatively severe level of operation either type of packing will burn if the leakage is reduced below say 10 ml. per minute per inch of shaft diameter.

It is interesting to plot the PV ranges for various common applications in a form such as illustrated in Fig. 3. Every combination of pressure and velocity is represented by a point in this diagram, and points of equivalent PV factor (or generated heat) lie on lines sloping at 45° to the abscissae. The distance of these constant PV lines from the origin is a measure of the severity of the service conditions with respect to heat generation. A typical test record of packing performance at a relatively high PV level is shown at Fig. 4.

How to Handle Pump Packing

The general considerations which govern packing performance have been discussed in the foregoing: Now to summarize the specific points which should be followed if most economical and satisfactory packing service is to be obtained.

1. In selecting packing for a specific service, follow the manufacturer's recommendations whenever possible. But remember that the manner in which the packing is installed, and subsequently handled, has the greatest influence on performance. A second-choice packing with first-rate handling will do better than a first choice packing indifferently installed and carelessly serviced.

2. After removing the packing from the container, place it on a piece of wrapping paper or newspaper, not on a dirty floor or bench top. Small chips of metal or other hard particles readily adhere to packings, and may do serious damage even to hardened shaft sleeves.

3. Remove all packing from the box to be packed except in the case of an emergency repair, when shut-down time is at a premium and a few rings of packing must be added as a temporary measure. Clean shaft and box, and apply lubricating oil generously to all surfaces to assist the packing to seat uniformly.

4. Check shaft or sleeve carefully for scoring or deep grooves. If packing performance has previously been poor, check for shaft run-out or sloppy bearing fit using an indicator. Poor mechanical condition should be corrected before proceeding if at all possible. If it is not possible to overhaul at the time of repacking, report the unsatisfactory condition immediately to the person responsible for scheduling repairs.

5. Check whether the packing is of correct dimensions for the space to be packed. If the packing is too large to permit easy insertion after it is curved around the rod, roll the packing so as to reduce the radial dimension slightly. Use a piece of pipe or shafting for this purpose, and roll with uniform pressure, applying the pipe or shaft in the manner of a rolling pin.

6. Cut the packing squarely to produce a butt joint. If the correct length is not known, determine it by curving a length of packing around the shaft (or around a piece of rod of the same diameter) and marking accurately across the back of the packing.

Use a very sharp knife. If the packing is of such construction that it tends to unravel or produce a ragged end, wrap a few turns of friction tape or Scotch tape snugly around the packing at the point to be cut, and remove after cutting.

7. Curve the packing gently around the shaft, press it firmly against the shaft at the cut ends, and push the ring into the stuffing box, entering the cut ends first. Push the first ring home.

8. The first ring must now be formed with as much care as if it were the only ring to be used. A pair of split sleeves made of pipe or hard wood are often used for this purpose. Alternatively, a split steel seating ring may be turned up on a lathe to the same dimensions as the packing ring. Each half of the steel ring is then tapped with one or two blind holes on one face so that studs of appropriate length may be screwed into the rings. The packing follower gland and nuts are then used to apply pressure through the studs and seating ring, and thus to the packing.

9. Install the balance of the packing, successively forming each ring as was done with the first ring. Stagger the joints so that each joint is located at about 180° to the joints of the adjacent rings.

10. If a lantern ring is used, install at the correct location. Check carefully to make sure that the fluid entry port will not be cut off as the result of a slight motion of the lantern ring into the stuffing box. In other words, the box should be filled with packing almost, but not quite, to the entry port, after which the lantern and remainder of the packing rings are added.

11. Compress the last rings snugly using the follower gland. Slacken off the stud nuts, and bring them up within about 1/64 inch of the gland to allow for slight expansion of packing at start. Finally, turn the unit over by hand to make sure that the packing is not excessively tight.

12. Observe the packing performance closely during the first few hours of run-in, and allow it to leak more heavily during this period than the acceptable normal leakage rate. If necessary, slack back further on the gland nuts to encourage leakage.

13. After the initial running in the packing may be taken up slightly. After the first adjustment do

not adjust for at least fifteen minutes. If the leakage is then still higher than acceptable, readjust and allow to stabilize for another fifteen minutes.

14. Remember that the lower the leakage is held, the shorter the packing life becomes, the more frequently the unit must be repacked and the higher becomes the packing cost.

How to Handle Flange Gaskets

1. Remove loose rust and scale from flange faces using wire brush.

2. Apply graphite to gasket surfaces; brush off excess. The use of hard-setting gasket pastes for sealing is not recommended because of the difficulty of cleaning the flanges when repacking. If the gasket cannot be made to seal without the use of a paste, there is something wrong either with the flange, or with the gasket material. The use of a paste may be necessary, however, to hold the gasket in place while the joint is being assembled, in which case it should be applied to one side only.

3. When tightening the bolts, work across the flange rather than around it. For example, on a six-bolt flange, tighten bolts Nos. 1, 4, 2, 5, 3, 6, and repeat until all are equally tight.

4. Within a day or two after the joint has been made up, retighten the bolts in order to take care of the initial loss of sealing pressure due to cold flow. In the case of steam piping, do not apply insulation to the flanges in such a way as to interfere with this operation until it has been carried out.

Conclusions

Packing and gasket costs are unnecessarily high in many plants because of incorrect installation and handling of packings and gasket materials. Savings in long-term packing costs can be made if the few simple points listed above are observed. Above all, careful and conscientious workmanship will pay dividends in extending packing life, and will increase production by reducing the number of shutdowns for repacking.

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Western New York TAPPI Discusses Stock Preparation

The regular monthly meeting of the Western New York Group, Empire State Section, Technical Association of the Pulp and Paper Industry, was held as a joint meeting with the Canadian Pulp and Paper Association, Technical Section, Niagara Branch on Dec. 10, 1947, at the Prospect House, Niagara Falls, N. Y.

A panel discussion on "Stock Preparation" was the topic of the evening. W. H. Monsson, Chairman of the Program Committee, introduced the panel, consisting of R. F. Vokes, Director of Laboratory, Dilts Machine Works, Fulton, N. Y.; C. H. Vickery, Manager of Sales, E. D. Jones Co., Pittsfield, Mass.; and D. G. Sutherland, Vice-President, Sutherland Refiner Corp., Trenton, N. J. After each member of the panel had spoken briefly on the methods and equipment used in stock preparation, the meeting was opened for discussion.

Mr. Vokes spoke on the different types of equipment used in stock preparations. He stressed the point that, because paper making fibers and papers made from the fibers have specific characteristics, specific equipment is needed for each step in stock preparation. He traced the flow of stock from its beginning as a raw suspension through to its entrance to the paper machine and described some of the functions of the different pieces of equipment used along the line of flow. Mr. Vokes showed how the flow and consistency of the stock was controlled at various points.

Mr. Vickery was next speaker and described what happens to fibers during processing. He defined the basic action of cutting and beating as the movement of one square edge against another square edge and pointed out that all types of beating and cutting machinery are constructed around this basic principle. Mr. Vickery listed the five main factors in beating and cutting machine design, operation, and performance, namely:

1. Inch cuts per minute or inch bar strokes per minute.
2. Square inches per minute to determine accumulated area in contact.
3. Maximum pressure used per unit of area.
4. Surface speed in feet per minute of rotor.
5. Power—how it is applied and distributed.

Mr. Sutherland spoke on the single disc type of pulp refiner and the efficiencies of various design. He outlined the calculations used in the designing of installations and the operation of refining equipment. He related different experiences encountered in pulp mills.

During the open discussion, many questions were addressed to and answered by the members of the panel. The definitions of many terms used in paper making were discussed.

The meeting was attended by approximately 100 technical men from local and near-by industries. Dr. A. H. Nadelman, International Paper Co., Niagara Falls, N. Y., presided.

Among those present at the dinner meeting were:

S. I. Anderson, H. P. Bailey, Albert E. Bishop, C. H. Bishop, C. Bradley, T. P. Brunish, P. E. McBurnett, Jack T. Cairnie, D. J. Campbell, Howard J. Comstock, W. U. Day, L. van Deursen, Wm. Dubart, Harry Duston, Harry E. Eamer, I. V. Earle, Joseph P. Early, Ralph Eiff, Roy Farley, F. L. Fennell, Robert J. Flygare, J. J. Forsythe, Herbert E. Freas, Albert L. Galsworthy, C. C. Gehring, D. H. Gimber, A. B. Gorham, H. Guest, Toney Guinta, P. N. Halliwell, A. D. Hamilton, Philip H. Hanrahan, A. C. Hayes, Frederick P. Heil, Henry A. Horstmann, G. H. Ireland, Percy Jackson, E. J. Johnstone, Earl E. Jones, Edward Kane, C. W. King, Wm. B. Korcheski, Willis Kramer, Paul Kuhnel, Wm. J. Lawrence, W. A. Logan, J. T. Loomer, Steve Lyko, W. J. McCrea, R. McCully, Albert Moccio, Wm. H. Monsson, John Morrison, Morris C. Musgrave, A. H. Nadelman, George E. Norton, Asa P. Nutter, W. M. Orchard, Robert F. Orton, J. S. Reichert, C. F. Robinson, Carl Rowe, Jack Rudolph, Robert D. Rusch, T. G. Rust, Salvatore M. Scaletta, Wm. Schofield, Frank C. Shearer, R. C. Shearer, William Shoubsall, Walter G. Skinner, Stewart Smith, S. G. Stapley, G. A. Stevens, W. Stevens, Gordon K. Storin, D. T. Sutherland, G. S. Sutherland, Caleb S. Taft, Robert G. Vaeth, C. H. Vickery, R. F. Vokes, Vernon Woodside, T. L. Yocum.

Application of the Electric Hygrometer To the Determination of Water Vapor Permeability at Low Temperature*

By J. A. Van den Akker[1]

Abstract

Of the various methods currently in use for the determination of water vapor permeability of moisture-resistant barriers, the hygrometric methods employing an electric hygrometer of special design are the most sensitive. An intrinsic difficulty with the gravimetric method at low temperature (0°F. and below) is the extremely small daily weight loss of cups sealed with good barriers. The development of special electric hygrometers having very small moisture absorption capacities has made possible the measurement of small water vapor permeability at low temperature. The special hygrometer and associated circuit are described. Three hygrometric methods employing this hygrometer for the low temperature determination of WVP are described and discussed. These are the dynamic method, *the* comparison method, *and the* sweep-gas method. *The most sensitive and rapid in use is the dynamic method, which is recommended for industrial control purposes and appears to be suitable for the testing of sheets (such as resins and waxes) of a nonhygroscopic nature. The comparison and sweep-gas methods are steady-state processes, and require the establishment of equilibrium; they are, accordingly, more time consuming than the dynamic method but yield results that are theoretically free of error resulting from sorption phenomena. Sources of error are discussed and a few precautions are suggested.*

The development, during recent years, of improved moisture-resistant films and the increasing need for reliable measurement of the water vapor permeability (WVP) of moisture barriers at low temperatures have prompted the Subcommittee on Instrumentation Research of the American Paper and Pulp Association to recommend the development, at the Institute, of new techniques. The research, initiated in 1940, was directed in its early phases to the evolution of hygrometric methods at ordinary temperatures. This work has been described in several reports to the A.P.P.A., all but one of which have appeared in the PAPER TRADE JOURNAL *(1)*. More recently the focus of attention has been on the development of techniques for applying these methods to the determination of WVP at low temperatures (0° F. and below). A detailed description of the problems encountered and of the experimental methods employed to solve them is presented in a recent report submitted to the A.P.P.A. *(2)*.

An intrinsic difficulty with the gravimetric method at low temperature can be illustrated with a numerical example. A fairly good barrier having a WVP of 0.1 gram per 100 sq. in. per day for a relative humidity differential of 50% at 73° F., may be taken for the purpose of estimating the daily weight loss at 0° F. If the same relative humidity differential were to be employed, the difference in partial pressures of the water vapor on the two sides of a specimen at the low temperature would be only 1/20 of that existing at room temperature. Assuming a specimen area of 20 sq. in., and neglecting the temperature effect on permeability to water vapor, the daily weight loss is found to be $(1/20)(20/100)(0.1) = 0.001$ gram. It is evident that the gravimetric method may not be expected to yield reliable information unless the test is permitted to run over a period of many days, and reasonably good accuracy could then be obtained *only if the weighings were made at the low temperature*. The gravimetric method may be of value for reference purposes, but it is undesirably slow for the control of production of moisture-resistant sheeting. A certain minimum time is required for a moisture-resistant sheet to equilibrate with the conditions of testing; it is desirable to have a method of testing which will evaluate the WVP in as short a time as possible after the elapse of that equilibration time.

Several years ago it was proposed that WVP be measured by means of a purely hygrometric method (*1*, Part I). Good sensitivity was expected on the basis of the fact that the change in mass of water vapor in a small volume of air corresponding to a 1% change in relative humidity is very small. It was expected, and the expectation has been realized, that very low rates of transfer of water vapor could be evaluated through measurement of changes in relative humidity. An important phase of the problem was the development of a hygrometer which would be small, accurate, sensitive, and which would not sorb an appreciable amount of moisture in the act of measuring relative humidity. Thanks to the ingenuity, care, and patience of Mr. Willmer A Wink, who is largely responsible for the laboratory work on this project, a very satisfactory modification of the Dunmore electric hygrometer *(3)* was evolved. It is desirable at this point to describe this special electric hygrometer, because it would seem to provide the most promising basis for any method of measuring WVP on the hygrometric principle.

Electric Hygrometer for WVP Determination

The Dunmore hygrometer *(3)* in its usual form is satisfactory for the measurement and control of relative humidity in fairly large spaces, such as those in cabinets, rooms, and ducts. Its moisture absorption capacity is, however, too large for the hygrometric WVP methods. The commercial literature of one producer of electric hygrometers of this type claims that relative humidity is measured without absorption of moisture; a statement of this sort is, of course,

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 24-28, 1947.

[1] Research Associate, The Institute of Paper Chemistry, Appleton, Wis.

relative, and it is true that the amount of moisture absorbed is entirely negligible when the supply of water vapor is large, as in a cabinet having a volume of 1,000,000 ml. However, the earliest attempts to employ electric hygrometers of reduced size indicated the need for further reduction in moisture absorption capacity, and the problem became acute when WVP determinations were first attempted at 0° F.—the latter statement can be appreciated when it is realized that the change in moisture content of 100 ml. of air at 0° F. corresponding to a change in relative humidity of 1% is only 1 microgram.

The present hygrometers are of extremely simple design. A sketch, showing various details of an element mounted on a glass plate, is given in Fig. 1. The body of the element is a small square of glass (about ½ inch on a side and ⅛ inch thick), on which a very thin film of platinum (opaque in strong light) has been deposited by evaporation in a vacuum or by the cathodic sputtering process. Prior to the deposition of the platinum film, the glass body is mounted on a metal plate and a fairly fine wire (roughly B&S gage 18) is pulled tautly from one edge of the metal plate down over the middle of the glass body to the opposite edge of the plate. This wire, which is subsequently removed, serves to form a gap in the film, thus providing two platinum film electrodes. (Where one wishes to prepare several elements, glass strips ½ inch wide and a few inches long are placed side by side on the metal plate, and a wire is drawn tautly over the long axis of each strip. Prior to the coating process, the strips were scratched cross-wise on their bottom surfaces, at ½-inch intervals, so that ½-inch square elements could be quickly formed after the deposition of the platinum film by breaking the glass strips at the scratch lines. This method of preparation has the added advantage of ensuring that the edges of each glass square at the ends of the gaps will be free of short-circuiting films of platinum.)

A film of partially hydrolyzed polyvinyl acetate (PVA) [containing a suitable, low percentage of lithium chloride (LiCl)] is applied to the center of the gap with a small glass rod having a tapered, fire-polished tip. The area of the spot thus formed is about 2 sq. mm. Further details are presented in Report 30, Part VIII, to the A.P.P.A. *(2)*.

After the LiCl-PVA film has been allowed to age for several days, the element is mounted in the WVP apparatus. As shown in Fig. 1, the simplest means for mounting is provided by a pair of spring-metal fingers (e.g., phosphor-bronze), which serve to hold

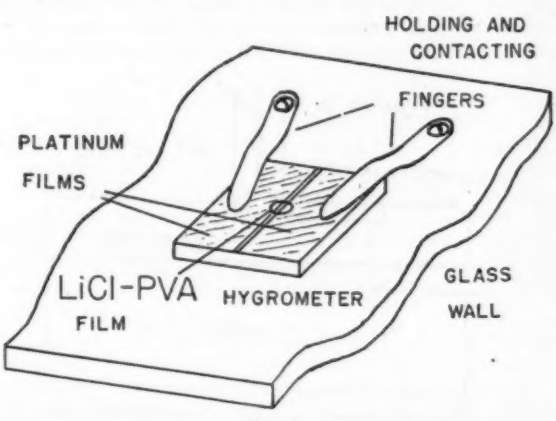

FIG. 1

Sketch of electric hygrometer for WVP determinations

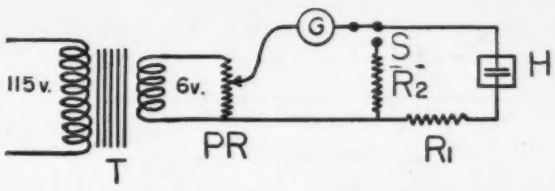

FIG. 2

Circuit for the current measuring device. T—Step-down transformer; PR—Potentiometer rheostat for control of voltage; G—Galvanometer, of sensitivity about 1 to 5 × 10^{-8} amp./div., equipped with instrument rectifier; S—s.p.d.t. switch having good electrical insulation; R_1—Protective resistance (about 10,000 ohms); H—Electric hygrometer; R_2—Resistance chosen to make the series combination of G and R_2 a voltmeter.

the element in place and furnish electrical connection between the platinum film electrodes and brass bolts through a large glass base plate or wall of a glass vessel. The connection between bolts, nuts, and glass on the opposite side of the wall are rendered gas tight by the application of hot wax.

A single, simple electrical unit, the circuit of which is shown in Fig. 2, enables one to measure the current through any one of a large number of hygrometers. Connection of the circuit to a unit is easily made by means of a pair of small "alligator clips." The voltage applied to the series combination of galvanometer, hygrometer, and protective resistance is observed and adjusted by switching the galvanometer to R_2 and manipulating the potentiometer rheostat PR. This voltage, which may be from about 1 to 5 volts, is held at the value adopted in the standardization of the hygrometer. The galvanometer is then switched to the hygrometer, the deflection of the galvanometer is noted, and the relative humidity is read from the calibration chart for the particular hygrometer. Typical calibration curves for various applied voltages are given in Report 30, Part VIII, to the A.P.P.A. *(2)*.

The required sensitivity of the galvanometer depends upon the temperature of the hygrometer. At room temperature, the galvanometer may be a microammeter having a range from about 0 to 50 microamperes, the range depending upon the applied voltage. However, at low temperatures, the effective resistance of a small hygrometer of the type described is quite high, and the galvanometer should have good sensitivity, preferably of the order of 1 to 5 × 10^{-8} ampere per division. If equipped with a series of sensitivity taps, the same galvanometer may be employed over a wide range of temperatures. The galvanometer must, of course, be equipped with an instrument rectifier.

The hygrometers may be conveniently calibrated at room temperature by exposing them to various relative humidities fixed by saturated salt solutions. Calibration at low temperature is, however, a very different matter. The relative humidities over saturated salt solutions at temperatures in the neighborhood of 0° F. are much too high to be useful, because they are typically of the order of 90 to 100%. Accurately known relative humidities may be produced and held constant by means of a double cryostat *(2)*. By means of refrigerating equipment and electrical controls,* the temperatures of a pair of alcohol baths are controlled within very small limits; one bath, containing the hygrometric apparatus, is maintained at, say, 0° F., and the other bath, always colder, is controlled at a temperature which, by calculation, gives

* Thermoregulators control heaters rather than the refrigerating equipment.

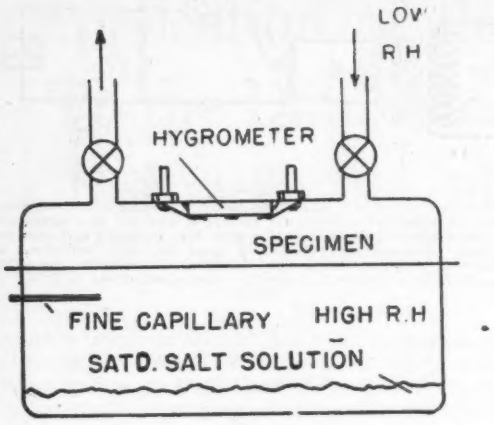

FIG. 3
Schematic sketch of apparatus for the dynamic method

rise to a saturated water-vapor pressure over ice that is equal to the desired vapor pressure in the equipment in the warmer bath. Two methods are employed to form a vapor bridge between the two cryostats. In one, an H-shaped glass vessel of rather large dimensions is lowered into the cryostats (which are side by side) in such manner that the left leg of the H, which contains the hygrometer to be calibrated, is immersed in the warmer bath and the right leg, which contains a small amount of ice, is lowered in the colder bath. The vessel is evacuated to reduce diffusion resistance to a negligible value, and is sealed off. The establishment of equilibrium requires a surprisingly short time. When the hygrometer current has been noted and recorded, the temperature of the colder bath is adjusted to a new value, and the process is repeated until an adequate calibration has been obtained. The other method is fundamentally the same, but involves a slow stream of air which first passes through a coil of copper tubing in the colder bath, thence through a coil in the warmer bath (in which the temperature of the air attains that of the warmer bath), and finally passes to the hygrometer or WVP apparatus in the warmer bath. The inner surface of the coil in the colder bath had been previously coated with ice by condensation, so that the air leaving the first coil is saturated with water vapor. This latter system is used in the new hygrometric method for measurement of WVP at low temperature.

DETERMINATION OF WVP BY HYGROMETRIC METHODS EMPLOYING THE SMALL ELECTRIC HYGROMETER

Dynamic Method. The most simple, sensitive, and fast method has been termed the dynamic method because it involves unsteady-state and nonequilibrium conditions. The development of this method has been given a great deal of attention because of the great need in the industry for faster control testing instruments. When allowance is made for the moisture absorption capacities of the test unit and of the side of the barrier facing the hygrometer, reasonably accurate results can be expected *(2)*. So far, promising results have been obtained for wax and resin films that are self supporting, or have paper on only one side. In the case of papers laminated with a moistureproof barrier, the absorption capacity of the paper on either side of the barrier is so high (relative to the moisture contained in air at 0° F.) that only inaccurate estimates of WVP can be made. The great advantage of the method is that, where applicable, a determination of WVP can be made in minutes or hours after the preconditioning period required for a specimen to equilibrate with the high and low humidities with which its faces are placed in contact. The time depends, of course, on the permeability of the barrier, being shorter for more permeable specimens. After the preconditioning period, a determination of WVP as low as 0.001 gram/100 sq. in./day at 0° F. and R.H. differential of 73% can be made in 4 to 5 hours *(2)*.

A schematic sketch showing the arrangement for the testing of WVP with the dynamic method is given in Fig. 3. The apparatus is contained in a liquid-tight vessel (not shown) which is immersed in the warmer cryostat. Dry air of known relative humidity from the colder cryostat is circulated over the specimen during the preconditioning period. The relative humidity of the air below the specimen is maintained at a constant, high value by means of a suitable saturated salt solution. When the test is begun, the valves are closed and the time is noted. The relative humidity is subsequently measured at suitably spaced times, and the data are plotted against the time. The *initial* rate of change of the relative humidity in the upper space is obtained from the plotted points. In this work, the relative humidity is not expressed in per cent, but in units of the scale on which the relative humidity of a saturated atmosphere is 1.0. The theory enabling one to calculate WVP from the initial rate of change of the relative humidity has been given in Parts V and VII of Report 30 to the A.P.P.A. *(1)*, and the author is pleased to report that the theory has been simplified in Part VIII of that report *(2)*.

The fine capillary shown in Fig. 3 serves to equalize the pressure in the lower compartment with that of the atmosphere. (The diffusion of water vapor through the capillary has no significant effect on the relative humidity in the lower chamber.)

For the purposes of research, WVP determinations have been made on one specimen at a time because of limited space in the cryostat. Where it is necessary to test a large number of specimens, it is suggested that a number of units of the kind previously described for work at room temperature *(1)* be prepared for use in a low temperature room in which the temperature is controlled and the relative humidity maintained at a constant, low value. Each unit, during the preconditioning period, would then consist only of the lower vessel with the specimen sealed in place. One, or several, upper compartments (each equipped with a calibrated electric hygrometer) could then be placed over the specimens (using greased seals) at the appropriate times, and the observations made at suitable intervals. In this case, the upper compart-

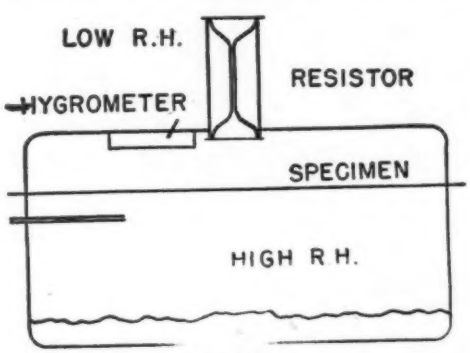

FIG. 4
Schematic sketch of apparatus for the comparison method

ments would be of very simple construction, because tube and valve connections would not be necessary. As stated earlier, a single electrical unit for the measurement of current would suffice for the testing of a large battery of test units. As a word of caution, the uncovered hands of operators in a room at 0° F. are to be regarded as hot, and should be brought into close proximity with the test units only momentarily, if at all. During the preconditioning period there should be an adequate movement of the room air over the specimens; where the WVP is very low, it is not necessary to provide as high air velocity as recommended in the earlier literature *(4)*.

Comparison Method. The originally proposed hygrometric method (*1*, Part I) was a steady-state comparison method. This method, although sensitive, is not as fast as the dynamic method because it requires that equilibrium between the specimen and the atmosphere above it be established. However, this method is free of error arising in the sorption of moisture by the upper surface of the specimen, the hygrometer, and other surfaces in the compartment containing the hygrometer.

The comparison method may be understood by referring to the sketch presented in Fig. 4. At equilibrium, the rate of diffusion of moisture through the specimen is equal to that of moisture passing through a standardized resistor. The resistor (one of a set covering a large range) is selected to have a permeability of the same order as that of the specimen, so that the equilibium relative humidity measured by the hygrometer in the upper compartment will be nearly mid-way between the fixed high and low relative humidities in the spaces, respectively, below the specimen, and outside of the test unit. If the rate of diffusion of moisture through the specimen is directly proportional to the relative humidity differential across the specimen, we can employ the relation

$$P_{specimen} = P_{standard} \times \frac{\Delta \text{ (R.H.) standard}}{\Delta \text{ (R.H.) specimen}}$$

to calculate the permeability of the specimen. This equation states that the permeabilities of the specimen and resistor are in inverse proportion to the relative humidity differentials existing across them at equilibrium.

It is well known that the rate of diffusion of moisture through certain materials does not vary in direct proportion with the relative humidity differential. For this reason, an attempt was made a few years ago, to develop variable resistances which, during the course of observations, would be adjusted to arrive at an equilibrium relative humidity in the upper compartment equal to a standard, predetermined value. All specimens would then be subjected to the same relative humidities in contact with their two sides, and to the same relative humidity differential. In particular, if the intermediate relative humidity were chosen to lie mid-way between the high and low humidities, the permeability of the specimen would be equal to that of the resistor, and its value could be read directly from the scale of the variable resistor. This promising approach to the problem awaits the development of a reproducible, yet cheap, variable resistance.

The use of fixed resistors should not lead to appreciable error if the intermediate relative humidity (through choice of resistor) can be made close to a standardized, predetermined value, because the curves relating rate of diffusion and relative humidity differential are not badly non-linear over small ranges.

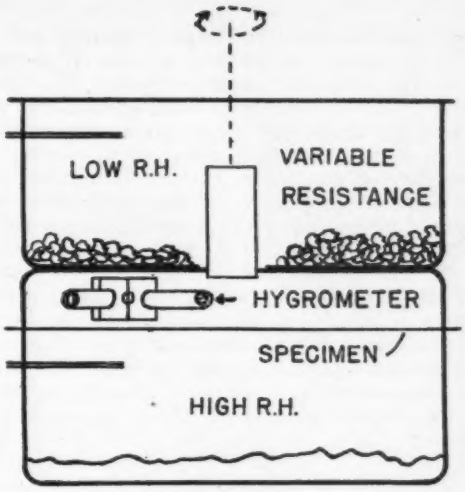

FIG. 5
Schematic sketch of apparatus for the comparison method, designed to accelerate equilibrium

If this approach is attempted, it is suggested that the resistors be prepared from glass capillary tubing, flared and covered at each end with thin permeable sheeting (such as tissue paper). There are, as yet, no data to recommend on capillary lengths and bores for various ranges of permeabilities.

The resistors employed in this method (whether fixed or variable) should be calibrated by careful observation of rate of loss of weight of a testing unit containing no specimen. In this standardizing work, the fine capillary in the side wall of the lower compartment should be sealed (a tiny drop of oil will accomplish this and permit pressure equalization), and great care should be exercised in obtaining a good seal between the two compartments.

The lower end of a resistor should be near the top wall of the upper compartment, because close proximity of that end to the specimen in normal testing would no longer permit us to assume that the diffusion resistance of the air in the upper compartment is negligible.

Testing with the comparison method can be accelerated if the specimen is preconditioned with air above the specimen (for example, the air of the room) having a relative humidity equal to the end-point value. It is then necessary to furnish the testing unit with a third compartment enclosing the upper end of the capillary in a space of low relative humidity, as shown in Fig. 5. This can be accomplished, of course, by distributing a desiccant over the floor of the third compartment. If this desirable modification is attempted, the electrical leads to the hygrometer should be brought through the side wall of the middle compartment.

If the specimen is preconditioned as suggested in the foregoing paragraph, the *initial* relative humidity will be equal to the end-point value. It therefore behooves the operator to observe (at not too frequent intervals of time) slight variations of the relative humidity away from the predetermined value, and to make suitable adjustment of the resistance (assuming the more ideal case of a standardized variable resistance). When he believes that balance has been attained, he should continue his observtion for a suitable period of time (a fraction of an hour, or many hours, according as the permeability is high or low.)

Sweep-gas Method. The high sensitivity of the electric hygrometer would seem to make it possible, as several persons have recently suggested, to measure WVP by means of a sweep-gas method similar to that employed by Davis *(5)* (who gives references to earlier workers) for the purpose of measuring the permeability of sheeting to gases. This method, like the comparison method, is of the steady-state class and would be free of error, at equilibrium, resulting from sorption of moisture by the specimen, hygrometer, etc. The method can be explained by reference to the schematic sketch given in Fig. 6, which depicts a simple form of apparatus embodying the hygrometric principle that is called into play. Two compartments are separated by the specimen. The lower compartment contains a saturated salt solution, which fixes the relative humidity of the air in contact with the lower side of the specimen at a definite, high value. Dry air, of known initial relative humidity r_1 (as determined by hygrometer 1), and of known volume rate of flow (as determined by a calibrated flow meter), enters the upper compartment, as shown. On the assumption that the air in the upper compartment is thoroughly mixed by circulation and turbulence, the air leaving the upper compartment will have a final relative humidity r_t (as determined by hygrometer 2) which can be related to the volume rate of flow of the air, the permeability and area of the specimen, and the initial relative humidity of the entering air.

Evidently there are at least two procedures which could be followed. In one, the volume rate of flow could be set at a suitable standard value, and the increment $r_t—r_1$ in the relative humidity of the streaming air could be measured. This procedure would result in a variable relative humidity differential across the specimen, the differential being smaller for specimens having larger permeability. In view of the earlier discussion of the undesirability of this state of affairs in the testing of certain types of barrier materials, a procedure should be sought which yields a standard relative humidity differential across all specimens; furthermore, in view of the very great range in permeability of different materials, a single standard rate of flow would not prove to be feasible. It would seem to be better practice to adjust the volume rate of flow of the air to obtain a standard value of the final relative humidity, r_t, because the relative humidity differential across the barrier would then be the same for all specimens. The range in volume rate of flow would be very great (corresponding to the large range in permeability of different materials), but this could be easily handled by having two or more calibrated flow meters.

If it be assumed, for the sake of discussion, that flow rate is varied to obtain a standard value of r_t, we may perform a few calculations indicative of the scope of the sweep-gas method. Let us consider three cases: (a), WVP=0.001 gram/100 sq. in./day for the given conditions of low temperature (taken as 0° F.) and relative humidity differential; (b), WVP=0.001 gram/100 sq. in. /day; (c), WVP= 0.1 gram/100 sq. in./day. There appears to be no objection, in the employment of this method, to the use of a large specimen, and the area may be taken literally equal to 100 sq. in. (if the specimen tends to sag under its own weight—the diameter of the disk would be about 11.3 inches—it may be supported by a wax-coated metal grid). For the purposes of estimation, take the density of saturated water vapor at 0° F. as 0.000001 gram/ml. Two considerations enter in the choice of the difference $r_t—r_1$. If this is made large, imperfect mixing of the air in the upper compartment will result in error caused by local variations in the relative humidity differential across the specimen; furthermore, an unnecessarily large value of the difference $r_t—r_1$ will cause the rate of flow to be needlessly low. On the other hand, $r_t—r_1$ should be fairly large in comparison with the error of the hygrometers. Where temperatures are well controlled, the constancy of calibration of a hygrometer at 0° F. is of the order of 0.2% R.H. If tubing and valving are arranged so that a single hygrometer can be employed to measure both r_1 and r_t a gradual drift in calibration will in itself cause no error, and the uncertainty in the determination of $r_t—r_1$ would probably be less than 0.2%. It would seem to be reasonable, then, to let $r_t—r_1=0.050$ (5.0% R.H.). The change in moisture content of 1 ml. of air corresponding to this difference is $(0.050)\ (10^{-6})=5 \times 10^{-8}$ gram/ml. Therefore, the rates of flow for the three cases would be:

Case A, $V = 0.001/(5 \times 10^{-8}) = 20{,}000$ ml./day $= 0.23$ ml./sec.
Case B, $V = 0.01/(5 \times 10^{-8}) = 200{,}000$ ml./day $= 2.3$ ml./sec.
Case C, $V = 0.1/(5 \times 10^{-8}) = 2{,}000{,}000$ ml./day $= 23$ ml./sec.

These rates appear to be quite feasible.

Some practical considerations come to mind. If the entrance tube to the upper compartment is not tapered to form a nozzle, the linear velocity of the air entering the compartment will be insufficient to cause mixing (particularly at the lower flow rates) and, as a result, the relative humidity above appreciable portions of the specimen may gradually rise to fairly high values. During this rise (which may require many hours), unsteady-state conditions would exist, and not all of the moisture diffusing through the specimen would leave with the departing air stream. Moreover, the relative humidity differential existing across the specimen would not have the standard value. However, if the entrance tube is equipped with a nozzle of size appropriate to the range of flow rate, velocity can be imparted to the air which should cause circulation of the type indicated by the dotted flow lines shown in Fig. 6. For example, if the rate of flow is 0.3 ml./sec., a nozzle having a bore of 0.014 inch would produce an air velocity of 300 cm./sec. (about 10 ft./sec.). The effectiveness of a nozzle should be checked by observing the circulation with smoke. It might prove to be desirable to correct the relative humidity indication of hygrometer 1 for the pressure drop across the nozzle.

The capillary of a flow meter employed for the lowest range of flow should be protected from fouling by means of a dust-collecting plug in its entrance tube.

In Davis' method for measuring gas permeabilities,

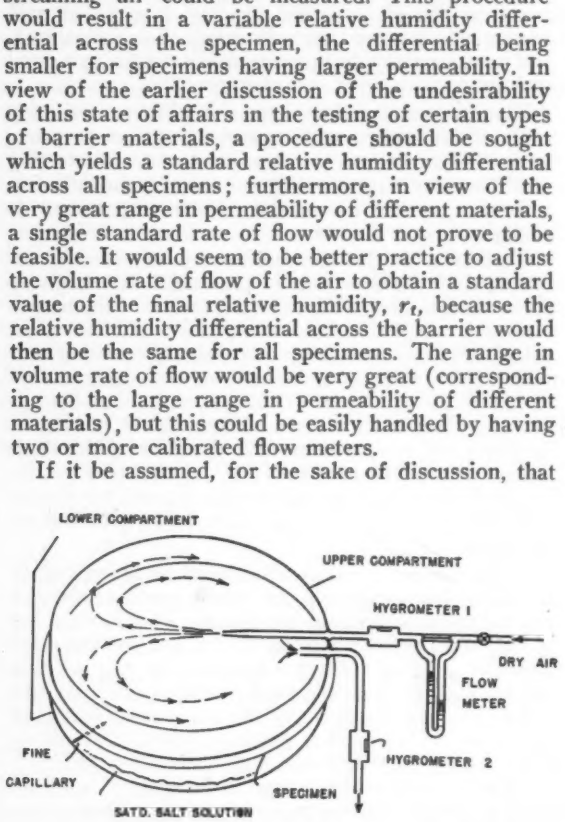

FIG. 6
Schematic sketch of apparatus for the sweep-gas method

the clay may be made and the salts obtained by evaporation, weighing the residue to determine the percentage on the clay. The second method is indirect, and comprises a determination of the specific resistance of a definite water extract of the clay, using one of the ordinary conductivity bridges as the measuring instrument. This does not give a direct result in percentage but may yield an index to the difference between satisfactory and unsatisfactory clays.

HAND SHEETS.

For direct comparison of gloss, color, and hiding power of clays the producer will prepare hand sheets, using the test samples in a standard coating formulation. This color may be applied to the sheet in various ways, but generally the most satisfactory method is the use of some type of blade applicator.

It is important that when such direct comparisons are to be made, care be taken to apply coatings which have the same film thickness and the same degree of make-down. With high-solids, it has been found convenient to use a small sigma-blade mixer such as is shown in Fig. 13.

The coating can be applied by use of the Bird film applicator which is shown in Fig. 14.

It is convenient to use a vacuum plate as a means of holding the paper sheet firmly and flat. With this instrument, one or more colors may be drawn down in such manner that direct comparison can be made between the films. In evaluating the characteristics of these films, it must be remembered that the more viscous coating color will apply a heavier coat than will those of lower viscosity. This heavier coating can often mask the effects of gloss and hiding power and must be taken into account when using this method of comparing clays.

It appears that an applicator having a clearance of about 0.003 inch is to be preferred, since this applicator will apply a sufficiently heavy coat to cover adequately any paper irregularities.

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Kalamazoo Holds Coating Session

The Kalamazoo Section of the Technical Association of the Pulp and Paper Industry held its annual coating meeting at the Columbia Hotel on Thursday, Dec. 11th, with over one hundred people in attendance. L. H. Mimms of the Kalamazoo Paper Company was the presiding officer.

The meeting was opened with the introduction of Werner Kaufmann, Chairman of the TAPPI Coating Committee, who made a few remarks regarding the committee's activities. Following this, the program chairman, V. Burstein of the Michigan Paper Company, introduced J. A. Van den Akker of the Institute of Paper Chemistry, who was the main speaker of the evening. Dr. Van den Akker discussed in detail some of the optical properties of paper such as: gloss, brightness, opacity and color. By means of equations, drawings, and graphs, he demonstrated methods of determining the scattering coefficients and adsorption coefficients of various materials. He illustrated the Kubelka Monk Theory by means of charts and also showed Adrian's modification; both of which were referred to later in the panel discussion. Dr. Van den Akker's talk formed a very good foundation for the panel discussion which followed. The members of this panel besides the speaker and the program chairman were: W. A. Kirkpatrick of the Allied Paper Company; E. G. Milham of the Watervliet Paper Company, and O. W. Callighan of Edgar Brothers.

The following is a list of those present:

C. E. Van Buren, Albany Felt, A. Aiken, H. R. Hall, F. Hamilton, W. Kirkpatrick, C. Lillie, I. Randall, Allied Paper Co.; A. F. Bigelow, W. J. Higbie, R. I. Rice, Am. Coating Mills; C. Hoelderle, Anheuser-Busch Co.; A. H. Fitzgerald, Archer-Daniels-Midland Co.; A. A. Finlay, Alliance Paper Co.; J. D. Simon, Bermingham-Prosser Co.; C. Weber, The Bristol Co.; W. H. Weitzel, Calgon Inc.; W. O. Manor, J. A. Hollinshead, P. F. Denna, Consolidated Paper Co.; R. H. Siple, Corn Products Sales; P. M. Jensen, E. K. Stilbert, A. E. Young, Dow Chemical Co.; T. S. Clausing, Eagle-Picher Ceton Div.; O. W. Callighan, Edgar Brothers Co.; C. W. Abbott, J. H. Compton Jr., Georgia Kaolin Co.; A. W. Reidel, Gus Reidel & Son; D. Militzer, Garrett-Burgess Inc.; G. D. Gerpheide, C. C. Schneider, H. P. StClair, L. O. Stafford, Hawthorne Paper Co.; F. Chappel, W. A. Lunsdorf, R. Mashburn, J. H. McClane, J. A. Stearin, J. W. Smith, H H. Parker, F. Schucker, D. Tool, R. T. Trelfa, H. Ware, Hercules Powder Co.; J. F. Marshall, Ingersol Rand Co.; J. A. Van den Akker, Institute of Paper Chemistry.

G. Jubb, A. Kuchta, L. H. Mimms, J. Causen, J. A. Wise, Kalamazoo Paper Co.; J. S. Chadderton, W. J. Curry, W. E. Hathaway, R. Hurst, M. W. Kane, L. H. LaLiberte, Kalamazoo Vegetable Parchment Com.; Werner Kaufman, Kupfer Bros.; C. Gardner, S. Kukolich, Lee Paper Co.; P. J. Waber, H. Kindig, MacSimBar Paper Co.; J. J. Harrison, G. E. Hoy, Michigan Carton Co.; R. L. Barton, V. Burstein, J. A. Dean, A. E. Hays, D. W. Stocker, Michigan Paper Co.; W. J. Sprau, National Gypsum Co.; J. A. Fritz, NOPCO Chem. Co.; F. B. Eilers, Orr Felt & Blanket Co.; R. Tutt, Peter Cooper Corp.; H. C. Bradford, A. Cole, H. Nendorf, Rex Paper Co.; D. W. MacArthur, P. Huckinson, Reichhold Chem. Co.; R. M. Ronningen, H. A. Ronningen, Ronningen Sales; A. C. Dreshfield, Consulting Engineer; L. C. Ganay, J. Hartung, C. Coertse, W. K. Kidder, K. W. Matreia, L. J. Smith, H. E. Sweetland, St. Regis Paper Company; C. T. Colgren, D. D. Batchelder, M. Galbraith, J. A. Heenan, M. S. Fogerty, A. L. Sherwood, G. Sutton, Sutherland Paper Co.; H. L. Vanderberg, J. P. Casey, A. E. Staley Mfg. Co., J. R. Fulgham, Socony-Vacuum Co.; W. Case, F. D. Elliot, D. R. Erickson, G. W. McKnight, T. McCallish, K. B. Latimer, P. Thomas, G. Swander, L. Orr, Time Incorporated; E. J. Milham, H. S. Faram, Watervliet Paper Co.; J. E. Shade, Wyandotte Chem. Co.

Ohio TAPPI Section Meets With Superintendents

A joint meeting of the Ohio Section of TAPPI and the Miami Valley Division of the Superintendents Association was held at the Manchester Hotel in Middletown, Ohio, on Saturday evening, December 13, 1947. Ninety-eight members of the two associations and guests enjoyed the dinner and the meeting following.

D. M. Yost, Chairman of the Ohio Section of TAPPI introduced the speaker of the evening, Mr. Harold Suhs, Chief Engineer of the Sorg Paper, a widely known and highly regarded power engineer and past chairman of the Miami Valley Superintendents Association. The speaker presented a very well prepared paper on the subject, "Power Plant Operations," which he illustrated with a large number of carefully selected lantern slides. The subject was a large one to cover in one evening and the slides illustrating the various types of equipment discussed were very helpful in making the discussion clear, particularly to those in the audience not well acquainted with the generation of power.

Since the group included many who have had little, if any, experience in power plant engineering, Mr. Suhs prepared his paper with that in mind. After a few introductory remarks showing the importance of power in public life, Mr. Suhs started his discussion proper with descriptions of the various types of steam boilers and the various types of fuel feeding equipment in use. As each of the different steam boilers and the different representative types of coal feeds were described some of the applications, advantages and limitations of each were explained. It was clear that the choice of such equipment involves very specialized engineering experience to fit the boiler and the auxiliary equipment to the load requirements, the water conditions, the fuel economically available and the like.

Steam turbines were the next power plant machines to be discussed. Here again, Mr. Suhs started with the simpler types represented by single wheel turbines, such as are used to drive pumps and the like and developed his theme by interspersing in turn the single and multiple extraction turbines and the back pressure turbines.

Following this, the speaker spoke briefly on coal; water; boiler and turbine scale, corrosion and erosion; electrical distribution; and finally on the later developments in gas, oil and coal turbines. Even though a large amount of material was covered, Mr. Suhs was able to intersperse his discussion with a few cautions and facts gained from experience. For example, he cautioned the mill operators about the inefficiencies and dangers of demanding sudden large changes in power and steam output and of applying steam to cold dryer cylinders too rapidly, causing dangerous strains and stresses. Another caution given was that against washing the paper machine motors along with the rest of the machine. Still another was that the life of most electrical wire insulation is not over twenty years and many mills may, therefore, have wiring needing inspection.

The response to Mr. Suhs' paper was evidenced by the length of the discussion period which was limited only by the lateness of the hour.

Among those present were the following: C. E. Ahlm, Joseph Atkinson, Charles H. Baker, G. A. Balko, L. B. Barnes, Edward D. Bast, Howard M. Bayler, R. B. Bennett, N. Beveridge, W. Boast, W. M. Boyer, C. E. Brandon, J. B. Brock, J. B. Burdsall, Howard Buechler, John Burnett, Max Bursk, Phil S. Cade, W. J. Carroll, J. L. Clouse, C. Cohun, W. L. Colgin, L. C. Currier, H. E. Davidson, John Dow, C. W. Faber, Joseph J. Fiori, Jr., Joseph J. Fiori, Sr., John M. Fisher, E. Fitzgerald, A. H. Frazer, A. F. Gardner, Leo Geise, Tom Gillespie, D. J. Goodman, J. F. Gravis, Ralph Hackenberry, H. H. Harrison, Robert Haxelton, Harold Hixon, J. A. Hoerner, T. Q. Holden, S. K. Holmes, Hubert Howard, Joseph S. Hunter, Carl Hutzelman, John E. Jack, Roy N. Johnson, George S. Johnston, Jr., L. R. Kendall, E. O. Knapp, Harold C. Koch, G. K. Larrick, H. C. Leighton, Edward Lum, C. H. Mannion, Kon Matchuck, Joe Maxwell, C. McConnell, C. E. McKasson, Chas. Moore, J. H. Moyer, D. W. Newell, Lowell M. Newman, John A. Owen, W. H. Owens, H. P. Petzold, Wm. Pevis, R. W. Polleys, H. C. Pooley, Wm. Reigers, Waldo Rhoades, E. A. Rinell, James F. Rice, A. S. Robbins, Carl D. Roess, P. M. Schaffrath, P. R. Schreiber, J. W. Schuster, Paul S. Shellenbarger, Wm. H. Sickels, W. C. Slattery, H. A. Smith, Claude A. Sorg, J. H. Tate, C. K. Textor, A. Thurn, Wm. W. Trummel, H. L. Vanderberg, J. L. Vanderberg, E. Yalny, D. M. Yost, Art Wilson, Myron Wittman, F. L. Zellers.

TAPPI Notes

Wm. M. Lehmukuhl, formerly of the Flintkote Company, is now assistant vice president of the Masonite Corporation, Chicago, Ill.

L. Morris Mitchell, consulting engineer, is now located at 104 East 40th Street, New York 16, N. Y.

Joseph F. Teti, formerly of the Brown Company, is now president of Specialty Converters, Inc., E. Braintree, Mass., and vice president of P. L. Andrews Corporation, Glendale, L. I.

Robert J. Lynch, formerly of the Owens-Illinois Glass Company, is now chief, solder and flux division, Research Department, Continental Can Company, 4546 W. Grand Ave., Chicago 39, Ill.

The Canadian Bemis Bag Company, Winnipeg, Manitoba, is now called Bonar & Bemis Ltd. B. D. Millidge is vice president.

J. W. Warner has succeeded W. E. Penfield as official corporate representative of the Gulf States Paper Corporation in the Technical Association.

Robert K. Prince is now manager of the wood processing machinery section, Allis-Chalmers Mfg. Company, Milwaukee, Wis.

D. L. Cleaves has succeeded B. O. Stewart as official corporate representative of the National Gypsum Company in the Technical Association.

The TAPPI Chicago Section will meet on Monday, January 19th at the Chicago Bar Association, Chicago, Ill. Robert Seidl of the Forest Products Laboratory, Madison, Wis., will discuss plastic-paper combinations.

The Western New York Branch of the TAPPI Empire State Section will meet at the Prospect House, Niagara Falls, N. Y. at 6:45 p.m. Wednesday, January 14, 1948.

The joint get-together of TAPPI and the Superintendents at Park-American Hotel, Kalamazoo, Mich., promises to be one of the best attended to date. In addition to the program previously announced Raymond F. Bennett of the Ecusta Paper Corporation, president of the Superintendents Association will be included as a meeting speaker.